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Appeal
Brief
10-24-99

In re Application of:

Donald K. Forest

Serial No.: 08/506,032

Filed: 24 July 1995

Title: DATA ENTRY METHOD

AND APPARATUS



Group Art Unit:

2774

Examiner:

Regina Liang

Applicant Document Number:

032-39

AMENDED APPEAL BRIEF

Honorable Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

An appeal was filed in the above-identified Application on 12 April 1999 and received by the PTO on 14 April 1999. Pursuant to the appeal, Appellant filed an Appeal Brief, Applicant Document No. 032-36 on 13 September 1999. The Examiner mailed to Appellant a Notification of Non-Compliance with 37 CFR §1.192(c) on 12 October 1999. This Amended Appeal Brief is filed in response to that Notification.

To the extent necessary, a petition for an extension of time under 37 C.F.R. §1.136 is hereby made.

The Commissioner is hereby authorized to charge any fees due under 37 C.F.R. §1.16 or §1.17 during the pendency of the present Application, including the appeal fee, appeal brief filing fee and extension of time fees, to Deposit Account No. 06-1553.

Appellant is prosecuting this application *pro se*.

Appellant respectfully solicits the Board's consideration of this Appeal and entry of this Amended Appeal Brief into the record of this application.

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I. REAL PARTY IN INTEREST

The Appellant, Donald K. Forest, is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences which will directly affect, be directly affected by, or have a bearing on the Board's decision in this appeal.

There are three copending applications related to this Application. These are: (1) the parent application, International Application Number PCT/US95/03591 filed 27 March 1995 entitled "Method of and Apparatus for Data Entry" which designated the United States. This International Application entered the U.S. National Stage on 16 September 1997 and was assigned U.S.

Application Serial No. 08/913,822. The application on appeal is a continuation-in-part application of the parent application; (2) a first sister application, U.S. Application Serial No. 08/506,152 filed 24 July 1995 entitled "Sound Operated Menu Method and Apparatus". This sister application is a continuation-in-part application of the parent application; and (3) a second sister application, U.S. Application Serial No. 08/506,445 filed 24 July 1995 currently (but not originally) entitled "User Interface Method and Apparatus". This sister application is a continuation-in-part application of the parent application.

III. STATUS OF CLAIMS

In this Application on 12 November 1998, Examiner Regina Liang issued an Office Action ("Final") rejecting claims 1, 19-41, 43-58, 61-80, 82-89, 94, 101-106, 108, and 112-205, constituting all pending claims. Appellant appeals from the rejection of each of the rejected claims.

Claims 2-18, 42, 59-60, 81, 90-93, 95-100, 107, and 109-111 have been canceled.

Appendix I lists all pending claims. Appendix II is a claim tree of all pending claims.

IV. STATUS OF AMENDMENTS

On 12 April 1999, subsequent to the Final, Appellant filed an Amendment After Final Rejection (AAF). On 6 May 1999 in the Advisory Action, the Examiner refused to enter the AAF. On 6 July 1999 Appellant petitioned the Commissioner for entry of the AAF. The Director of Group 2770, acting for the Commissioner, refused entry of the AAF on 16 August 1999.

The claims appearing in the Appendix of this Amended Appeal Brief and argued herein are the claims rejected in the Final, without the amendments of the AAF.

V. SUMMARY OF INVENTION

A. Background

The present invention is directed both to an apparatus and method for selecting an option from a menu, particularly by individuals with neurogenic muscular disorders ("NMD operators"), e.g. such as Cerebral Palsy ("CP"), Traumatic Brain Injury, Spinal Cord Injury, Muscular Dystrophy, Amyotrophic Lateral Sclerosis and Multiple Sclerosis. These conditions can result in one or more of the following symptoms: muscle spasticity, involuntary muscle tremors, a tendency for a body member to move slightly ("drift") when the operator wants it to remain still, voluntary muscle activity causing involuntary motion, impaired ability to voluntarily stop motion, and/or impaired ability to

coordinate muscle activity. Any one of these symptoms may impair an affected individual's fine motor control. Moreover, while some individuals affected by a neuromuscular disorder may be able to exercise fine motor control with enormous effort, the struggle to do so often fatigues the individual, limiting the period of time the individual is capable or comfortable performing the fine motor control task.

Neuromuscular disorders are often systemic in effect, impairing an individual's ability to operate prosthetic devices, such as a wheelchair, and to perform the activities of daily life, such as speaking, walking and operating household appliances. Speech is frequently affected since the mechanics of producing speech require coordination of many muscle groups -- the muscles of the diaphragm which push air over the vocal cords, the muscles of the larynx, jaws, tongue and lips. The inability to use or coordinate these muscle groups may result in impaired speech. Impaired fine motor control may prevent or impede an individuals from effectively operating voice output devices, household appliances or computer input devices.

Devices are available which produce speech, control appliances and facilitate computer access for NMD operators. Devices which produce speech for individuals whose own speech is impaired allow the operator to select words or phrases by spelling the words, by specifying an abbreviation for the phrase or by selecting a sequence of symbols, and then speak the selected words or phrases using an electronic speech synthesizer. However, due to the systemic nature of neuromuscular disorders, NMD operators are often unable to efficiently use a standard keyboard and mouse. For example, an NMD operator, e.g. someone with spastic cerebral palsy, who is unable to stop the movement of a limb with precision, when attempting to use a keyboard or mouse, may move his arm toward the target key or move the cursor toward the target object on the display but overshoot the target. If he has involuntary tremors and cannot hold a limb still, then, when attempting to use a keyboard, he may hit keys adjacent to his target key. If he has involuntary motion moving left to right, then, when attempting to use a keyboard, he may have difficulty accessing an intended key on the right side of the keyboard.

The problem of menu selection for NMD operators is most easily understood in the context of access to applications running on a general purpose microcomputer system. One conventional system for computer access, called an "on-screen keyboard", illustrated in Figure 1 of the Specification of the present Application (reproduced in Appendix III), is a picture of keyboard drawn on a computer display (1101). The operator selects a letter by pointing to that letter's key image on the display with a pointing device ("pointer"), then indicating that he has reached his target either by operating a

switch, a process called selection by click, or by maintaining the location indicated by the pointer ("dwelling") on the key image for a predetermined period of time (the "selection threshold"), a process called selection by dwell. A program executing on the computer determines which letter the operator has selected and processes the letter or passes it to some other application program which processes the letter as if it came from a true keyboard.

Due to impaired fine motor control, many NMD operators have difficulty selecting a key image by click or by dwell and this difficulty increases as the size of the key image decreases. Figure 1 shows an on-screen keyboard containing 81 total keys including 26 alphabetic keys, 10 numeric keys, 12 function keys, 4 arrow keys and 29 special purpose keys. Drawing this many key images on a display restricts the size of each key image making each very difficult for many NMD operators to select.

When a display is shared between application program output (0203) and an on-screen keyboard (0201), as is the display shown in Figure 2 of the present Specification (reproduced in Appendix III), the size of each key image must be reduced from its size in Figure 1 to allow space for the application program output. Thus, as more display space is allotted to application program output, the key images become more difficult for an NMD operator to select.

The reason the NMD operator is using the computer is to run the application. The NMD operator, like most users, needs a large amount of contiguous display space dedicated to the output of the computer application program so he can see where he is in the application program process, i.e. what he has accomplished, what is next to do, both short-term and long-term, and what his immediate options are. In the conventional on-screen keyboard, the menu competes with the application program for fixed display space. As more of the display is given over to information display, selecting from a menu becomes more difficult. Alternatively, most of the display may be devoted to menu options, but then the user has smaller and/or fewer visual cues as to his progress in the computer task at hand.

As mentioned previously, many NMD operators have impaired speech due to their motor disorder and consequently use voice output devices. Problems of computer access due to impaired motor control significantly reduce the speed of selection and consequently the rate of word production, causing problems in conversation (Specification, p.9, lines 1-14).

B. The Invention

The structure and operation of the invention is best explained in the context of one

embodiment of the invention, shown in Figures 17 and 18 of the present Specification (reproduced in Appendix III). Figure 17 shows the display (2112) of a general purpose computer system and eight selectable regions. Each of the eight selectable regions consists of the union of a visible subregion on the display and an invisible subregion located outside the display and adjacent the visible subregion.

5 For example, the selectable region at 11 o'clock in Figure 17 labeled with menu option "vort<space>x" consists of invisible subregion (0104) and visible subregion (0106), and within this description of the invention is referred to as selectable region (0104/0106). The other selectable regions shown in Figure 17, proceeding counter clockwise from selectable region (0104/0106) are (0108/0110), (0112/0114), (0116/0118), (0120/0122), (0124/0126), (0128/0130) and (0132/0134).
10 Each subregion may be sized to suit the operator's preferences and abilities. Each selectable region is associated respectively with a menu option. In Figure 17, selectable region (0104/0106) is associated with menu option vort<space>x, selectable region (0108/0110) with menu option "sumac", selectable region (0112/0114) with menu option "wizen", selectable region (0116/0118) with the menu option undo indicated by an icon on visible subregion (0118) representing an undo function, selectable
15 region (0120/0122) with menu option "words", selectable region (0124/0126) with menu option "talk", selectable region (0128/0130) with menu option "ldhbfk" and selectable region (0132/0134) with menu option "ypgqj,". Together, the eight visible subregions circumscribe region (0150) on the display.

To select a menu option "vort<space>x" the operator moves a pointer coupled to the general
20 purpose computer system to indicate a location on selectable region (0104/0106) and maintains the indicated location on the selectable region for the selection threshold period. Once this selectable region is selected, the display changes to that shown in Figure 18. In Figure 18, each of six selectable regions is now associated with a submenu option of the selected menu option "vort<space>x". Selectable region (0104/0106) is now associated with submenu option "<space>", selectable region
25 (0108/0110) with submenu option "o", selectable region (0112/0114) with submenu option "t", selectable region (0124/0126) with submenu option "x", selectable region (0128/0130) with submenu option "v", and selectable region (0132/0134) with submenu option "r". Selectable regions (0116/0118) and (0120/0122) remains associated with the same menu options with which each was associated in Figure 17. The operator may now select one of these submenu options.

30 C. New Results

The invention facilitates computer access for NMD operators by **simultaneously**

accommodating each of the symptoms described above.

1. accommodate overshoot

Because NMD operators often have impaired ability to voluntarily stop motion, they tend to overshoot their targets. The invention accommodates overshoot by arranging selectable regions around a working region on the display and then expanding the **effective area** of the selectable regions. The effective area may be expanded in any of three ways: (1) the user or a pointer he controls is prevented from indicating a location beyond the display either by a physical barrier (Figures 26 and 27 of the present Specification (reproduced in Appendix III)) ("confining"), (2) the pointer tracking mechanism returns only locations on the display ("clipping"); or (3) each selectable region has an activation area extending beyond the display.

Overshoot and impaired ability to stop motion are discussed in the Specification at p.2, line 27 - p.3, line 6; p. 11, lines 12-13; p.13, lines 16-30; p.14, lines 7-18; p.15, lines 26-27; p.16, line 15 - p.17, line 16; p.46, lines 1-27; and p.61, line 31 - p.62, line 29. Overshoot is illustrated in Figure 17 of the present Application (points 0158 and 0162).

2. accommodate tremor

Very large selectable regions greatly facilitate menu selection by NMD operators. Large selectable regions forgive tremor so long as the operator oscillates within the selectable region. The larger the region, the easier selection is for the NMD operator.

3. accommodate drift

Large selectable regions forgive drift so long as the operator drifts within the selectable region. The larger the region, the more NMD operator can drift and still select his intended target.

Tremor, drift, and impaired fine motor control are discussed in the Specification at p.2, lines 3-13; p.3, lines 3-5; p.6, lines 16-18; p.7, lines 4-9; p.8, lines 7-8; p.11, lines 9-10; p.13, lines 14-20; p.15, lines 31-32; p.16, lines 9-11; p.16, line 15 - p.17, line 5; 30; p.46, lines 16-21; p.62 line 31 - p.63, line 22; p.73, line 25 - p.74, line 12; p.78, line 30 - p.79, line 32; and p.81, lines 3-23. Drift is illustrated in Figure 43 of the present Application (the path from point 0404 to point 0408).

4. accommodate involuntary motion accompanying voluntary motion

An operator whose voluntary muscle activity causes **involuntary motion** and so moves in an unintended direction can raise the selection threshold so that he has enough time to

correct his position prior to selection.

Involuntary motion accompanying voluntary motion is discussed in the Specification at p.2, lines 5-10; p.3, lines 5-6; p.8, lines 7-12; p.14, lines 11-12; p.46, lines 16-21.

5. allow large contiguous application program space

5 The present invention addresses the need of an NMD operator, in a system with a single display, to **simultaneously** (a) see a large contiguous on-screen display of the output of an application program, and (b) use very large selectable regions for selection by dwell. This is accomplished in part by using the space **outside** the display for selectable regions. However, delimiting selectable regions outside the display may introduce another problem: indicating to the user the location of each selectable region and the menu option associated with it. Aspects of the invention address this problem as well, by optionally indicating on the display (1) the location, and (2) the associated menu options of the selectable regions outside the display.

10 Simultaneously allowing a large contiguous on-screen application program space and using very large selectable regions is discussed in the Specification at p.3, lines 19-23; p.5, line 31 - p.6, line 3; p.6, lines 11-14; p.7, lines 11-21; p.11, lines 15-16; p.42, lines 1-18; p. 46, line 24 - p.47, line 1; p.44, line 21 - p.45, line 4; p.73, lines 11-15; and p.99, lines 3-12; and is illustrated in Figures 17-22, 26-27, 31-36, 44-46, and 52-53.

6. increase the speed of selection

20 As described above, each menu option is associated with a selectable region. The width of the selectable region is unconstrained by the display, and so potentially very large, even infinite. In accord with Fitts' Law, described below, the user's movement time to the selectable region is reduced.

25 This conclusion flows from the theory of human-computer interfaces, and in particular, movement time. Movement time, as the name suggests, is the time required to move a pointer from the current location to a target. Movement time is a function of the amplitude of the movement required and the **width of the target**. In the case of a manually selected target, the amplitude of the movement is the distance to the target. Fitts, P.M., "The information capacity of the human motor system in controlling the amplitude of movement", *Journal of Experimental Psychology*, 1954, vol. 47, pp. 381-391. Fitts hypothesized that a given human movement has a characteristic index of difficulty, called ID, where

30
$$ID = \log_2 (2A / W)$$

where

A = average amplitude of a human movement

W = target width

Within limits, movement time is a function of ID, according to the equation:

$$MT = a + bID$$

where

MT = movement time

a = constant

b = constant

ID = index of difficulty

Investigators, with minor exceptions, have reported findings that provide general confirmation of Fitts's theory. (see citations reported in Fitts, P.M. and Peterson, J.R., "Information capacity of discrete motor responses", *Journal of Experimental Psychology*, vol. 67, pp. 103-112, 1964, at p.104, col. 1, line 41 - col. 2, line 2).

Increasing the speed of selection or the speed of data entry is discussed in the Specification at p.9, lines 1-22; p.11, line 30; p.13, lines 26-28; p.15, lines 9-11; p.15, line 15; p.18, lines 18-26; p.20, lines 18-22; p.21, line 30; p.26, line 33 - p.27, line 1; p.90, lines 8-20; p.92, lines 14-19. Embodiments of the invention which increase speed are shown in Figures 17-22, 26-27, 31-36, 44-46, and 52-53.

7. decrease the error rate

NMD operators who cannot effectively use either a conventional keyboard or a pointing device but can reliably actuate a switch may use a computer access method called "scanning". (Specification, p.6, line 5 - p.8, line29). However, NMD operators using single switch systems are typically prone to errors. Scanning requires switch activation at a particular time (Specification, p.8, line 22). Cerebral palsy affects the ability initiate muscle movement. Consequently, NMD operators often activate the switch either too early or too late, resulting in an error. Elongating the scan interval may reduce errors, but also reduces productivity, since the user must wait longer for the desired option to be available for selection. Furthermore, an NMD operator with involuntary movement may unintentionally activate his switch. Usually the switch is positioned close to the operator's head or other body member used for activation. While this facilitates switch activation, involuntary movement can cause unintentional switch activations.

Decreasing the error rate is discussed in the Specification at p.8, lines 7-15; p.13, lines 14-23; p.14, lines 7-18; p.16, lines 1-2; p.17, lines 15-16; p.18, and p.74, lines 4-12.

Decreasing the error rate increases the rate of correct selections (the rate of data entry), increases productivity, and facilitates computer access. Speeding data entry, increasing productivity, and facilitating computer access by a disabled operator are objects of the invention (Specification, p.11, line 7; p.18, lines 28-29; p.11, line 30).

The new results listed above are demonstrated in the video tape described below.

VI. VIDEO TAPE DEMONSTRATION

Video Tape 032-27, filed 12 April 1999, was considered by the Examiner and has been entered into the record of this Application (Decision on Petition Filed Under 37 CFR 1.181, dated 16 August 1999, p.3, lines 37 - 41).

The Video Tape shows a severely disabled individual using a prototype of the invention for computer access and voice output. The individual, Ray, is a 27 year old white male. Ray has been diagnosed with cerebral palsy, spastic quadriplegia and mild mental retardation. Ray is unable to produce any speech sounds. Ray is literate. Ray's normal access method for his computer and voice output device is single switch scanning, described in the Specification, p.8, lines 17 - 32.

The demonstration on the Video Tape is approximately seven minutes long.

On the Video Tape Ray evidences several of the symptoms of neurogenic movement disorders described above. These symptoms are evident with careful viewing of cursor movement on the Tape run in slow motion. Exemplary abnormal movements of the types previously described are categorized and discussed below, including time indices so the discussion below can be correlated to the Tape. The time indices are approximate, and may be off a few seconds.

1. impaired ability to voluntarily stop motion

Ray evidences the tendency of individuals with muscle spasticity to overshoot a target. At approximately 5:27 into the Video Tape, Ray twice selects the lower left selectable region. Prior to the first of these two selections, the region is labeled "wizen". Prior to the second selection, the region is labeled "w". During both selections, Ray overshoots the target. When Ray overshoots and indicates a location outside the screen, the system automatically replaces the arrow cursor with the diamond cursor. The diamond cursor is displayed on the screen at the location closest to the location outside the screen actually indicated by Ray.

2. tremor

Ray's head oscillates horizontally and vertically following head movement. This is evident at approximately 3:26 into the Video Tape when Ray selects the lower left selectable region, and again at approximately 4:14 when Ray selects the middle left region.

3. drift

The Video Tape does not show Ray drifting.

4. involuntary motion accompanying voluntary motion

During head movement, occasionally Ray temporarily loses control of his head; his movements become erratic. For example, at approximately 4:05 into the Video Tape, Ray's target is the upper right selectable region. Before finally reaching the target, the cursor intersects, for a short period, the regions at the bottom center, top left, middle left, bottom center (again), and top left (again). None of the unintended regions are selected because Ray is able to move the cursor out of the region before reaching the selection threshold.

5. allow large contiguous application program space

The structure of the invention is shown on the Tape at approximately 1:57 into the Video Tape. Eight selectable regions are each adjacent an application area. The application area shown on the Tape is occupied by the output of a voice output application.

6. increase the speed of selection

Ray selects letters significantly faster using the prototype shown on the Tape than with his single switch scanning system.

Ray's rate of selection using either (a) the hypothetical system described in the Final composed of selected elements of the applied art, or (b) the system disclosed by Ito, is unknown. The hypothetical system does not exist and consequently cannot be tested. Testing Ray on Ito's integrated display/input device would be pointless because: (1) Ray is quadriplegic and cannot hold or control Ito's stylus; (2) Ray cannot maintain a pointer on a desired location and simultaneously operate a switch (click), as required by Ito's system; and (3) the selection regions of Ito's system are too small for Ray to reliably indicate. If Ray had these abilities, he would not currently be using single switch scanning for voice output and computer access.

7. decrease the error rate

Ray demonstrates a very low error rate using the prototype.

Achieving these new results, individually and simultaneously, is **unexpected** for someone of Ray's motor capabilities.

VII. TERMINOLOGY

5 Certain terms used in the claims and their definitions in the present Specification are listed below

A. dwell event

10 "A dwell event includes, but is not limited to, each of the following: (a) the durations of one or more periods of intersection of locations indicated by a movement related signal, a body member or a cursor (including any part of the cursor) and a selectable region equalling or exceeding a predetermined period; (b) a first quantity responsive to the durations of the periods referred to in (a) equalling or exceeding a predetermined quantity; (c) dwell event (a) or (b) followed by a location indicated by the movement related signal, the body member or the cursor no longer intersecting the intersected selectable region; and (d) dwell event (a) or (b) wherein the period of intersection
15 required for selection of a selectable region increases in response to a non-intersection or a period of non-intersection of locations indicated by the movement related signal, the body member or the cursor and the selectable region ("dynamic dwell event"). The use of non-intersection or a period of non-intersection in determining the duration of a period of intersection required for selection is called dynamic dwell. Associated with each type of dwell event is an intersected selectable region. This is
20 the selectable region intersected by the location indicated by the movement related signal, body member or cursor which triggers the dwell event by causing the period or the first quantity to equal or exceed the predetermined period or the predetermined quantity, respectively." Specification, p.43, lines 1-16.

25 B. selection event

"A selection event includes, but is not limited to: (a) a dwell event; (b) a switch operation at or near the time of an intersection of a location indicated by a movement related signal, a body member or a cursor and a selectable region; (c) an intersection of a location indicated by a movement related
30 signal, a body member or a cursor and a selectable region; and (d) selection event (c) followed by a location indicated by the movement related signal, the body member or the cursor no longer intersecting the selectable region it previously intersected. Associated with each type of selection event is an intersected selectable region. This is the selectable region intersected by the location

indicated by the movement related signal, body member or cursor.” Specification, p.43, lines 18-25.

VIII. ISSUES

The issue headings used throughout this Amended Appeal Brief are intended as shorthand to facilitate locating the discussion of an issue within this lengthy document, not as a summary of the claim or issue described under that heading. The language of the claim, not the heading, defines the scope of the coverage.

10	<u>Issues concerning many claims</u>	47
	1. Whether the Examiner has rebutted Appellant's assertion of discovery of the source of the problem.	47
15	2. Whether the applied references teach the particular limitations in claims 21, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, 35, 36, 37, 38, 39, 47, 48, 49, 53, 55, 56, 61, 67, 76, 77, 82, 86, 87, 88, 89, 94, 104, 105, 117, 118, 119, 120, 121, 122, 123, 124, 128, 129, 130, 136, 137, 138, 139, 140, 142, 143, 144, 145, 148, 154, 155, 156, 157, 160, 162, 169, 174, 177, 183, 184, 185, 200, 201, 202, 203, and 205.	48
	3. Whether Ito and Lazzaro are combinable.	48
20	4. Whether Ito and Atkinson are combinable.	50
	5. Whether the subject matter of each pending claim, taken as a whole, would have been obvious.	51
25	<u>Independent claim 19 and its dependent claims</u>	53
	6. With respect to claim 19, whether the new result of accommodating overshoot is obvious.	53
	7. With respect to claim 19, whether the new results of accommodating each of tremor and drift are obvious.	54
30	8. With respect to claim 19, whether the new result of simultaneously accommodating impaired fine motor control and providing space for an application program window is obvious	55

9.	With respect to claim 19, whether the new result of increased speed of selection is obvious.	55
10.	With respect to claim 19, whether the new result of decreasing error rate is obvious.	56
5	11. With respect to claim 19, whether Ito teaches selectable regions adjacent a confiner.	56
12.	With respect to claim 20, whether the Final provides a motivation to make the proposed modification of Ito.	57
10	13. With respect to claim 20, whether Ito teaches a circumscribing plurality of selectable regions on the display	58
14.	With respect to claim 20, whether Ito teaches selectable regions adjacent a confiner and on the display	59
15.	With respect to claim 21, whether the proposed combination discloses “at least one of the selectable regions intersecting the at least partially circumscribed region”.	60
15	16. With respect to claim 23, whether the proposed combination teaches: (a) switching between (b) two confining polygons (c) responsive to an intersection	60
17.	With respect to claim 24, whether the proposed combination teaches: (a) switching between (b) two confining polygons (c) responsive to a distance between two of the successive locations.	60
20	18. With respect to claim 25, whether the proposed combination teaches: (a) switching between (b) two confining polygons (c) responsive to an angle indicated by three of the successive locations.	60
19.	With respect to claim 26, whether the proposed combination teaches two confining polygons intersecting one another.	60
25	20. With respect to claim 27, whether the proposed combination teaches two confining polygons, one including all the area of the other.	61
21.	With respect to claim 82, whether the proposed combination teaches: (a) switching between (b) two confining polygons (c) responsive to a sensor signal indicative of an actual or attempted muscle activation	61
30	22. With respect to claim 28, whether the proposed combination teaches selection responsive to a distance of overshoot.	61
23.	With respect to claim 29, whether the proposed combination teaches selection responsive	

	to a distance of overshoot.	61
24.	With respect to claim 32, whether the proposed combination teaches any of the enumerated icons.	61
5	<u>Independent claim 33 and its dependent claims</u>	62
25.	With respect to claim 33, whether the proposed combination teaches selectable regions partially on and partially outside the display area.	62
26.	With respect to claim 33, whether the new results of accomodating overshoot is obvious.	63
10	27. With respect to claim 33, whether the new results of accommodating each of tremor and drift are obvious.	63
28.	With respect to claim 33, whether the new result of simultaneously accommodating impaired fine motor control and providing space for an application program window is obvious.	64
15	29. With respect to claim 33, whether the new result of increased speed of selection is obvious.	64
30.	With respect to claim 33, whether the new result of decreasing error rate is obvious.	64
20	31. With respect to claim 33, whether the proposed combination teaches selectable regions on the display area.	64
32.	With respect to claim 33, whether the Examiner's rejection evidences improper hindsight	64
33.	With respect to claim 34, whether the proposed combination teaches selection of a character from a character hierarchy	65
25	34. With respect to claim 35, whether the proposed combination teaches any of the enumerated characteristics.	65
35.	With respect to claim 36, whether the proposed combination teaches distributing perimeter submenu options responsive to frequency of use	66
30	36. With respect to claim 37, whether the proposed combination teaches the claimed relationship between screen distance and frequency of use	66
37.	With respect to claim 38, whether the proposed combination teaches the claimed relationship between the position of a character and the position of a submenu	

option. 66

Independent claim 114 and its dependent claims 66

- 5 38. With respect to claim 114, whether the new result of **accommodating overshoot** is obvious. 67
39. With respect to claim 114, whether the new result of **increased speed** of selection is obvious. 67
- 10 40. With respect to claim 114, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious. 68
41. With respect to claim 114, whether the new results of **accommodating each of tremor and drift** are obvious. 68
- 15 42. With respect to claim 114, whether the new result of **decreasing error rate** is obvious. 68
43. With respect to claim 114, whether Ito teaches selectable regions **adjacent a confiner**. 68
44. With respect to claim 114, whether Ito and Baker are combinable. 68
- 20 45. With respect to claim 114, whether Baker teaches **simultaneously** displayed menu options. 69
46. With respect to claim 114, whether Baker teaches **selecting** by moving the cursor within a selectable region. 70
- 25 47. With respect to claim 114, whether the Final evidences improper hindsight reconstruction of references. 71
48. With respect to the first embodiment of claim 114, the proposed combination teaches circumscribing selectable regions **on** the display screen. 72
49. With respect to the first embodiment of claim 114, whether the Final provides a motivation to make the proposed modification of Ito. 72
- 30 50. With respect to the first embodiment of claim 114, whether the proposed combination teaches selectable regions **partially on and partially outside** the display. 72
51. With respect to the second embodiment of claim 114, whether Baker teaches a selectable

	region including a subregion outside the display screen.	72
52.	With respect to the second embodiment of claim 114, whether the proposed combination of Ito and Lazzaro teaches selection by dwell of a selectable region outside the display screen.	73
53.	With respect to claim 114, whether Ito, as combined with Baker, and Golding are combinable.	73
54.	With respect to claim 116, whether the proposed combination teaches deleting selection by click.	73
55.	With respect to claim 117, whether the proposed combination teaches the claimed predetermined period	74
56.	With respect to claim 202, whether the proposed combination teaches that the predetermined period is a function of detected user fatigue	74
57.	With respect to claim 118, whether the proposed combination teaches non-adjacent selectable regions.	74
58.	With respect to claim 119, whether the proposed combination teaches a second selectable region adjacent the external boundary of one of the first selectable regions.	74
59.	With respect to claim 120, whether the proposed combination teaches confining the movement related signal on two sides of a selectable region.	74
60.	With respect to claim 121, whether the proposed combination teaches confiner penetrable under certain conditions.	74
61.	With respect to claim 122, whether the proposed combination teaches displaying a second cursor responsive to the location indicated by the movement related signal. ...	75
62.	With respect to claim 123, whether the proposed combination teaches repeating the previously spoken first sequence.	75
63.	With respect to claim 124, whether the proposed combination teaches repeating the previously spoken first sequence either more loudly or more slowly	75
64.	With respect to claim 126, whether Baker teaches selectable regions outside the display screen.	75
65.	With respect to claim 127, whether Ito teaches a plurality of indicators on the display.	75
66.	With respect to claim 128, whether the proposed combination teaches intersection	

	indicators.	75
67.	With respect to claim 129, whether the proposed combination teaches disabling .	76
68.	With respect to claim 130, whether the proposed combination teaches enabling .	76
69.	With respect to claim 131, whether the new result of simultaneously accommodating impaired fine motor control and providing space for an application program window is obvious	76
70.	With respect to claim 169, whether the proposed combination teaches voice output responsive to a path of the user movement.	76
71.	With respect to claim 200, whether the proposed combination teaches voice output responsive to a ratio between durations.	76
72.	With respect to claim 201, whether the proposed combination teaches a distance indicator .	76
<u>Independent claim 52</u>		76
<u>Independent claim 53</u>		77
73.	With respect to claim 53, whether the proposed combination teaches selection responsive to the durations of a plurality of successive periods of intersection.	77
74.	With respect to claim 53, whether Ito teaches a circumscribing plurality of selectable regions on the display.	77
75.	With respect to claim 53, whether the Final provides a motivation to make the proposed modification of Ito.	77
<u>Independent claim 65 and its dependent claims</u>		77
76.	With respect to claim 65, whether the new result of accommodating overshoot is obvious.	77
77.	With respect to claim 65, whether the new result of increased speed of selection is obvious.	78
78.	With respect to claim 65, whether the new result of simultaneously accommodating	

impaired fine motor control and providing space for an application program window is obvious.

- 78
79. With respect to claim 65, whether the new results of **accommodating each of tremor and drift** are obvious. 78
80. With respect to claim 65, whether the new result of **decreasing error rate** is obvious. 78
81. With respect to claim 66, whether Ito teaches selectable regions **adjacent** a confiner. 78

Independent claim 67 and its dependent claims 78

82. With respect to claim 67, whether Anderson teaches a user activatable switch having a **plurality of positions**. 78
83. With respect to claim 67, whether the Final provides a motivation to make the proposed combination/modification with Anderson. 79
84. With respect to claim 67, whether the proposed combination teaches selection responsive to a **period of switch activation**. 79
85. With respect to claim 67, whether the new result of **accommodating overshoot** is obvious. 80
86. With respect to claim 67, whether the new result of **increased speed** of selection is obvious. 80
87. With respect to claim 67, whether the Final provides a motivation to make the proposed modification of Ito. 80
88. With respect to claim 67, whether the Examiner's rejection evidences improper hindsight. 80

Independent claim 85 and its dependent claims 81

89. With respect to claim 85, whether the combination of Ito and Lazzaro teaches the claimed apparatus. 81

	90. With respect to claim 85, whether Ito and Baker are combinable.	81
	91. With respect to claim 85, whether the Final evidences improper hindsight reconstruction of references.	81
5	92. With respect to claim 86, whether the proposed combination teaches indicating which menu is associated with dwell selectable regions.	81
	93. With respect to claim 101, whether the proposed combination teaches a menu option representing a sequence of one or more words.	82
	94. With respect to claim 101, whether Ito, as combined with Baker, and Golding are combinable.	82
10	95. With respect to claim 102, whether the new result of accommodating overshoot is obvious.	82
	96. With respect to claim 102, whether the new result of increased speed of selection is obvious.	82
15	97. With respect to claim 102, whether the new result of simultaneously accommodating impaired fine motor control and providing space for an application program window is obvious.	82
	98. With respect to claim 102, whether the new results of accommodating each of tremor and drift are obvious.	82
20	99. With respect to claim 102, whether the new result of decreasing error rate is obvious.	82
	100. With respect to claim 102, whether the proposed combination teaches selectable regions partially on and partially outside the surface.	82
25	101. With respect to claim 87, whether the proposed combination teaches a signal level threshold	83
	102. With respect to claim 88, whether the proposed combination teaches a signal duration threshold	83
30	103. With respect to claim 105, whether the proposed combination teaches selection means responsive to a sound	83
	<u>Independent claim 94</u>	83

104.	With respect to claim 94, whether the Ito alone teaches the claimed apparatus.	83
105.	With respect to claim 94, whether the proposed combination teaches an invisible selectable region outside the display screen.	83
106.	With respect to claim 94, whether Baker teaches an invisible selectable regions outside the display screen.	84
107.	With respect to claim 94, whether the new result of increased speed of selection is obvious.	84
108.	With respect to claim 94, whether Ito, as combined with Baker, and Golding are combinable.	84

Independent claim 106 and its dependent claims 84

109.	With respect to claim 106, whether the proposed combination teaches selectable regions partially on and partially outside the display.	84
110.	With respect to claim 106, the proposed combination teaches circumscribing selectable regions on the display.	84
111.	With respect to claim 106, whether the new result of accommodating overshoot is obvious.	84
112.	With respect to claim 106, whether the Final provides a motivation to make the proposed modification of Ito.	85
113.	With respect to claim 106, whether the new result of increased speed of selection is obvious.	85
114.	With respect to claim 106, whether the new result of simultaneously accommodating impaired fine motor control and providing space for an application program window is obvious.	85
115.	With respect to claim 106, whether the new results of accommodating each of tremor and drift are obvious.	85
116.	With respect to claim 106, whether the new result of decreasing error rate is obvious.	85
117.	With respect to claim 106, whether the Final provides a motivation to make the proposed modification of Ito.	85

	<u>Independent claim 134 and its dependent claims</u>	85
	118. With respect to claim 134, whether Choi is pertinent prior art	86
	119. With respect to claim 134, whether Choi teaches a dwell time indicator	86
5	120. With respect to claim 134, whether the proposed combination teaches the new result achieved.	87
	121. With respect to claim 134, whether Ito, as combined with Baker, and Golding are combinable.	88
10	122. With respect to claim 136, whether the proposed combination teaches a remaining dwell time indicator	88
	123. With respect to claim 137, whether the proposed combination teaches an indicator for indicating non-intersection after a dwell indication	88
	124. With respect to claim 138, whether the proposed combination teaches an indicator for indicating the duration of a period of non-intersection after a dwell indication . . .	88
15	125. With respect to claim 139, whether the proposed combination teaches an indicator for indicating opposite indications of the duration of periods of intersection and non- intersection.	88
	126. With respect to claim 140, whether the proposed combination teaches a dwell time indication by modification in brightness	89
20	127. With respect to claim 142, whether the proposed combination teaches a gradually increasing dwell time indication and a marked indication for selection.	89
	128. With respect to claim 143, whether the proposed combination teaches a selection indication by modification in hue	89
25	129. With respect to claim 144, whether the proposed combination teaches an indicator intersecting the selectable region.	89
	130. With respect to claim 145, whether the proposed combination teaches an indicator coterminous with the selectable region.	89
	131. With respect to claim 146, whether the new result of accomodating overshoot is obvious.	89
30	132. With respect to claim 146, whether Ito teaches selectable regions adjacent a confiner	89

	<u>Independent claim 155 and its dependent claims</u>	89
	133. With respect to claim 155, whether the proposed combination teaches selection responsive to the durations of a plurality of successive periods of intersection.	90
5	134. With respect to claim 155, whether Ito teaches selectable regions adjacent a confiner	90
	135. With respect to claim 155, whether the new result of accomodating overshoot is obvious.	90
	136. With respect to claim 155, whether the new result of increased speed of selection is obvious.	90
10	137. With respect to claim 155, whether the new result of simultaneously accommodating impaired fine motor control and providing space for an application program window is obvious.	90
	138. With respect to claim 155, whether the new results of accomodating each of tremor and drift are obvious.	90
15	139. With respect to claim 155, whether the new result of decreasing error rate is obvious.	91
	140. With respect to claim 155, whether the Final evidences improper hindsight reconstruction of references.	91
20	141. With respect to the first embodiment of claim 155, the proposed combination teaches circumscribing selectable regions on the display screen.	91
	142. With respect to the first embodiment of claim 155, whether the Final provides a motivation to make the proposed modification of Ito.	91
25	143. With respect to the first embodiment of claim 155, whether Ito teaches selectable regions adjacent a confiner and on the display.	91
	144. With respect to the first embodiment of claim 155, whether Ito and Baker are combinable.	91
	145. With respect to the first embodiment of claim 155, whether Ito teaches selectable regions on the display.	91
30	146. With respect to the first embodiment of claim 155, whether the proposed combination teaches selectable regions partially on and partially outside the display.	92
	147. With respect to the second embodiment of claim 155, whether Baker teaches	

	simultaneously displayed menu options	92
148.	With respect to the second embodiment of claim 155, whether Baker teaches selecting by moving the cursor within a selectable region.	92
149.	With respect to claim 155, whether Ito, as combined with Baker, and Golding are combinable.	92
150.	With respect to claim 156, whether the proposed combination teaches selection responsive to the duration of a period of non-intersection	92
151.	With respect to claim 157, whether the proposed combination teaches intersection and non-intersection having the claimed opposing effect on selection.	92
	<u>Independent claim 159</u>	92
152.	With respect to claim 159, whether Anderson teaches a user activatable switch having a plurality of positions	92
153.	With respect to claim 159, whether the Final provides a motivation to make the proposed combination/modification with Anderson.	93
154.	With respect to claim 159, whether the proposed combination teaches selection responsive to a period of switch activation	93
155.	With respect to claim 159, whether the new result of accomodating overshoot is obvious.	93
156.	With respect to claim 159, whether the new result of increased speed of selection is obvious.	93
157.	With respect to claim 159, whether the Examiner's rejection evidences improper hindsight.	93
158.	With respect to claim 159, whether Ito teaches displayed menu options on the display area	93
	<u>Independent claim 160</u>	93
159.	With respect to claim 160, whether the proposed combination teaches a remaining dwell time indicator	93

	160. With respect to claim 160, whether the proposed combination teaches selection responsive to a period of switch activation	94
	161. With respect to claim 160, whether the new result of accomodating overshoot is obvious.	94
5	162. With respect to claim 160, whether the new result of increased speed of selection is obvious.	94
	163. With respect to claim 160, whether Anderson teaches a user activatable switch having a plurality of positions	94
10	164. With respect to claim 160, whether the Final provides a motivation to make the proposed combination/modification with Anderson.	94
	165. With respect to claim 160, whether the Examiner's rejection evidences improper hindsight.	94
15	 <u>Independent claim 161</u>	94
	166. With respect to claim 161, whether Anderson teaches a user activatable switch having a plurality of positions	95
20	167. With respect to claim 161, whether the Final provides a motivation to make the proposed combination/modification with Anderson.	95
	168. With respect to claim 161, whether the proposed combination teaches selection responsive to a period of switch activation	95
	169. With respect to claim 161, whether the new result of accomodating overshoot is obvious.	95
25	170. With respect to claim 160, whether the new result of increased speed of selection is obvious.	95
	171. With respect to claim 161, whether the Examiner's rejection evidences improper hindsight.	95
30	172. With respect to claim 161, whether Ito teaches displayed menu options on the display area.	95

	<u>Independent claim 162</u>	95
	173. With respect to claim 162, whether the proposed combination teaches selection responsive to a plurality of periods of switch activation.	95
5	174. With respect to claim 162, whether Anderson teaches a user activatable switch having a plurality of positions	96
	175. With respect to claim 162, whether the Final provides a motivation to make the proposed combination/modification with Anderson.	96
10	176. With respect to claim 162, whether the new result of accomodating overshoot is obvious.	96
	177. With respect to claim 106, whether the new results of accomodating each of tremor and drift are obvious.	96
	178. With respect to claim 162, whether the Examiner's rejection evidences improper hindsight.	96
15	179. With respect to claim 162, whether Ito teaches displayed menu options on the display area.	96
	 <u>Independent claim 78</u>	96
20	180. With respect to claim 78, whether the proposed combination teaches an invisible selectable subregion outside the display area.	97
	181. With respect to claim 78, the proposed combination teaches circumscribing selectable regions on the display	97
25	182. With respect to claim 78, whether the Final provides a motivation to make the proposed modification of Ito.	97
	183. With respect to claim 78, whether the proposed combination teaches selectable regions partially on and partially outside the display.	97
	184. With respect to claim 78, whether the new result of accomodating overshoot is obvious.	97
30	185. With respect to claim 78, whether the new result of increased speed of selection is obvious.	97
	186. With respect to claim 78, whether the new result of simultaneously accommodating	

	impaired fine motor control and providing space for an application program window is obvious.	97
	187. With respect to claim 78, whether the new results of accomodating each of tremor and drift are obvious.	97
5	188. With respect to claim 78, whether the new result of decreasing error rate is obvious.	97
	<u>Independent claim 79</u>	97
10	189. With respect to claim 79, whether Ito teaches selectable regions adjacent a confiner	98
	190. With respect to claim 79, the proposed combination teaches circumscribing selectable regions on the display	98
15	191. With respect to claim 79, whether the Final provides a motivation to make the proposed modification of Ito.	98
	192. With respect to claim 79, whether Ito teaches selectable regions adjacent a confiner and on the display	98
	193. With respect to claim 65, whether the new result of accomodating overshoot is obvious.	98
20	194. With respect to claim 65, whether the new result of increased speed of selection is obvious.	98
	195. With respect to claim 65, whether the new result of simultaneously accommodating impaired fine motor control and providing space for an application program window is obvious.	98
25	196. With respect to claim 65, whether the new results of accomodating each of tremor and drift are obvious.	98
30	197. With respect to claim 65, whether the new result of decreasing error rate is obvious.	99
	<u>Independent claim 80</u>	99

	198. With respect to claim 80, whether Ito teaches selectable regions adjacent a confiner .	99
	199. With respect to claim 80, the proposed combination teaches circumscribing selectable regions on the display .	99
5	200. With respect to claim 80, whether the Final provides a motivation to make the proposed modification of Ito.	99
	201. With respect to claim 80, whether Ito teaches selectable regions adjacent a confiner and on the display .	99
	202. With respect to claim 80, whether the new result of accomodating overshoot is obvious.	99
10	203. With respect to claim 80, whether the new result of increased speed of selection is obvious.	99
	204. With respect to claim 80, whether the new result of simultaneously accommodating impaired fine motor control and providing space for an application program window is obvious.	100
15	205. With respect to claim 80, whether the new results of accomodating each of tremor and drift are obvious.	100
	206. With respect to claim 80, whether the new result of decreasing error rate is obvious.	100
20	207. With respect to claim 80, whether Ito and Baker are combinable.	100
	208. With respect to claim 80, whether the Final evidences improper hindsight reconstruction of references.	100
25	209. With respect to claim 80, whether Ito, as combined with Baker, and Golding are combinable.	100
	<u>Independent claim 163</u>	100
30	210. With respect to claim 163, whether the new result of accomodating overshoot is obvious.	100
	211. With respect to claim 163, whether the new result of increased speed of selection is	

	obvious.	101
5	212. With respect to claim 163, whether the new result of simultaneously accommodating impaired fine motor control and providing space for an application program window is obvious.	101
	213. With respect to claim 163, whether the new results of accomodating each of tremor and drift are obvious.	101
10	214. With respect to claim 163, whether the new result of decreasing error rate is obvious.	101
	215. With respect to claim 163, whether Ito and Baker are combinable.	101
	216. With respect to claim 163, whether the Final evidences improper hindsight reconstruction of references.	101
15	217. With respect to claim 163, whether Ito, as combined with Baker, and Golding are combinable.	101
	<u>Independent claim 170 and its dependent claims</u>	101
20	218. With respect to claim 170, whether the proposed combination of Ito and Lazzaro teaches selection by dwell of a selectable region outside the display screen.	101
	219. With respect to claim 172, whether the proposed combination teaches selection responsive to the durations of a plurality of successive periods of intersection.	102
	220. With respect to claim 173, whether the proposed combination teaches a partially invisible selectable region outside the display screen.	102
25	221. With respect to claim 174, whether the proposed combination teaches at most one of the selectable regions is adjacent the display screen.	102
	222. With respect to claim 177, whether the proposed combination teaches selection responsive to a ratio between durations.	102
	223. With respect to claim 178, whether Ito teaches a plurality of selectable regions on the display.	102
30	224. With respect to claim 178, whether the proposed combination teaches selectable regions partially on and partially outside the display.	102
	225. With respect to claim 179, whether the new result of accomodating overshoot is	

	obvious.	102
	226. With respect to claim 179, whether the new result of increased speed of selection is obvious.	103
5	227. With respect to claim 179, whether the new result of simultaneously accommodating impaired fine motor control and providing space for an application program window is obvious.	103
	228. With respect to claim 179, whether the new results of accomodating each of tremor and drift are obvious.	103
10	229. With respect to claim 179, whether the new result of decreasing error rate is obvious.	103
	230. With respect to claim 180, whether the proposed combination teaches selectable regions on the display	103
15	231. With respect to claim 180, whether the Final provides a motivation to make the proposed modification of Ito.	103
	232. With respect to claim 181, whether the proposed combination teaches circumscribing selectable regions on the display	103
	233. With respect to claim 182, whether Choi is pertinent prior art	103
20	234. With respect to claim 182, whether Choi teaches a dwel time indicator	103
	235. With respect to claim 182,whether the proposed combination teaches a remaining dwel time indicator.	104
	236. With respect to claim 183, whether the proposed combination teaches a tactile indicator	104
25	237. With respect to claim 184, whether the proposed combination teaches indicating on the screen the location of one of the successive locations located outside the screen. ...	104
	238. With respect to claim 185, whether the proposed combination teaches indicating the distance to one of the successive locations located outside the display screen.	104
	239. With respect to claim 186, whether the proposed combination teaches selection responsive to detected user fatigue	104
30	240. With respect to claim 187, whether the proposed combination teaches a remaining dwel time indicator.	104

241.	With respect to claim 188, whether the proposed combination teaches selectable regions partially on and partially outside the display.	104
242.	With respect to claim 189, whether the proposed combination teaches dynamic menus on the display.	104
243.	With respect to claim 190, whether the proposed combination teaches an invisible selectable region outside the display screen.	105
244.	With respect to claim 191, whether Atkinson teaches a menu and its submenu associated with the same selectable regions	105
245.	With respect to claim 191, whether Atkinson can be modified so its menus and submenu are associated with the same selectable regions.	105
246.	With respect to claim 192, whether Ito, as combined with Baker, and Golding are combinable.	105
247.	With respect to claim 193, whether the proposed combination teaches an invisible selectable region outside the display screen.	105
248.	With respect to claim 195, whether the proposed combination teaches selectable regions partially on and partially outside the display.	106
249.	With respect to claim 196, whether whether the proposed combination teaches the claimed device controller.	106
 <u>Independent claim 1 and its dependent claims</u>		106
250.	With respect to claim 204, whether the proposed combination teaches a movement related signal receiving means that is not flush against the display screen	106
251.	With respect to claim 205, whether the proposed combination teaches a selectable region having a size of at least 5% of the user's range of motion	106
 <u>Independent claim 54 and its dependent claims</u>		107
252.	With respect to claim 54, whether the proposed combination teaches selection responsive to only an intersection of a cursor and a selectable region.	107
253.	With respect to claim 54, whether Atkinson teaches selection responsive to only an intersection of a cursor and a selectable region.	107
254.	With respect to claim 54, whether Baker teaches selecting by moving the cursor within a	

	selectable region.	107
	255. With respect to claim 54, the proposed combination teaches circumscribing regions on the display	108
5	256. With respect to claim 55, whether the proposed combination teaches displaying circumscribing regions responsive to a switch operation.	108
	257. With respect to claim 56, whether the proposed combination teaches displaying selectable regions responsive to a switch operation signal.	108
10	<u>Independent claim 147 and its dependent claims</u>	108
	258. With respect to claim 147, whether Ito teaches selectable regions adjacent a confiner	108
	259. With respect to claim 147, whether the new result of accomodating overshoot is obvious.	108
15	260. With respect to claim 147, whether the new result of increased speed of selection is obvious.	108
	261. With respect to claim 147, whether the Final evidences improper hindsight reconstruction of references.	109
20	262. With respect to the first embodiment of claim 147, the proposed combination teaches circumscribing selectable regions on the display area	109
	263. With respect to the first embodiment of claim 147, whether the Final provides a motivation to make the proposed modification of Ito.	109
	264. With respect to the first embodiment of claim 147, whether Ito teaches selectable regions adjacent a confiner and on the display	109
25	265. With respect to the first embodiment of claim 147, whether Ito and Baker are combinable.	109
	266. With respect to the first embodiment of claim 147, whether Ito teaches selectable regions on the display	109
30	267. With respect to the first embodiment of claim 147, whether the proposed combination teaches selectable regions partially on and partially outside the display	109
	268. With respect to the second embodiment of claim 147, whether Ito teaches simultaneously displayed menu options on the display area	110

269.	With respect to the second embodiment of claim 147, whether Baker teaches simultaneously displayed menu options on the display area.	110
270.	With respect to claim 147, whether Ito, as combined with Baker, and Golding are combinable.	110
5 271.	With respect to claim 148, whether the proposed combination teaches the claimed relationship between a menu option and a submenu option.	110
272.	With respect to claim 149, whether the proposed combination teaches any of the enumerated classes.	110
10 273.	With respect to claim 150, whether the proposed combination teaches distributing menu options.	110
274.	With respect to claim 151, whether the proposed combination teaches distributing perimeter submenu options responsive to frequency of use.	110
275.	With respect to claim 152, whether the proposed combination teaches the claimed relationship between screen distance and frequency of use.	110
15 276.	With respect to claim 153, whether the proposed combination teaches the claimed relationship between the position of a character and the position of a submenu option.	111
277.	With respect to claim 154, whether the proposed combination teaches any of the enumerated symbols.	111
20 278.	With respect to claim 167, whether the proposed combination teaches hierarchical perimeter menus including overlapping selectable regions.	111
279.	With respect to claim 168, whether the proposed combination teaches hierarchical perimeter menus including a plurality of overlapping selectable regions.	111
25 280.	With respect to claim 203, whether the proposed combination teaches any of the enumerated classes of characters or words.	111
 <u>Independent claim 158</u>		111
30 281.	With respect to claim 158, whether Ito teaches selectable regions adjacent a confiner.	112
282.	With respect to claim 158, whether the new result of accomodating overshoot is obvious.	112

283.	With respect to claim 158, whether the new result of increased speed of selection is obvious.	112
284.	With respect to claim 158, whether Baker teaches selecting by moving the cursor within a selectable region.	112
5 285.	With respect to claim 158, whether Ito and Baker are combinable.	112
286.	With respect to claim 158, whether the Final evidences improper hindsight reconstruction of references.	112
287.	With respect to the first embodiment of claim 158, the proposed combination teaches circumscribing selectable regions on the display screen.	112
10 288.	With respect to the first embodiment of claim 158, whether the Final provides a motivation to make the proposed modification of Ito.	112
289.	With respect to the first embodiment of claim 158, whether Ito teaches selectable regions adjacent a confiner and on the display.	113
15 290.	With respect to the first embodiment of claim 158, whether the proposed combination teaches selectable regions partially on and partially outside the display.	113
291.	With respect to the second embodiment of claim 158, whether Baker teaches a selectable region including a subregion outside the display screen.	113
	<u>Independent claim 165</u>	113
20 292.	With respect to claim 165, whether Ito teaches selectable regions adjacent a confiner	113
293.	With respect to claim 165, whether the new result of accomodating overshoot is obvious.	113
25 294.	With respect to claim 165, whether the new result of increased speed of selection is obvious.	113
295.	With respect to claim 165, whether Baker teaches simultaneously displayed menu options	113
296.	With respect to claim 165, whether Ito and Baker are combinable.	114
30 297.	With respect to claim 165, whether the Final evidences improper hindsight reconstruction of references.	114
298.	With respect to claim 165, whether Baker teaches selecting by moving the cursor within a selectable region.	114

299.	With respect to the first embodiment of claim 165, the proposed combination teaches circumscribing selectable regions on the display screen .	114
300.	With respect to the first embodiment of claim 165, whether the Final provides a motivation to make the proposed modification of Ito.	114
301.	With respect to the first embodiment of claim 165, whether Ito teaches selectable regions adjacent a confiner and on the display .	114
302.	With respect to the first embodiment of claim 165, whether the proposed combination teaches selectable regions partially on and partially outside the display.	114
303.	With respect to the second embodiment of claim 165, whether Baker teaches a selectable region including a subregion outside the display screen.	114
304.	With respect to claim 165, whether Ito, as combined with Baker, and Golding are combinable.	115
 <u>Independent claim 198</u>		115
305.	With respect to claim 198, whether Ito teaches selectable regions on the display .	115
306.	With respect to claim 198, whether Baker teaches simultaneously displayed menu options.	115
307.	With respect to claim 198, whether Ito, as combined with Baker, and Golding are combinable.	115
 <u>Independent claim 39 and its dependent claims</u>		115
308.	With respect to claim 39, whether the Ito, Lazzaro, or Baker teaches indicators for indicating intersection of selectable regions outside the display area .	115
309.	With respect to claim 39, whether Ito and Baker are combinable.	116
310.	With respect to claim 39, whether the Final evidences improper hindsight reconstruction of references.	116
311.	With respect to claim 44, whether Ito teaches on-display menu options indicating the location of off-display selectable regions .	116
312.	With respect to claim 44, whether Baker teaches on-display menu options indicating the location of off-display selectable regions .	117

313.	With respect to claim 47, whether the proposed combination teaches disabling .	117
314.	With respect to claim 48, whether the proposed combination teaches enabling .	117
315.	With respect to claim 49, whether the proposed combination teaches partially delimited selectable regions.	117

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	<u>Independent claim 61 and its dependent claims</u>	117
316.	With respect to claim 61, whether the proposed combination teaches a clipper .	117
317.	With respect to claim 61, whether the proposed combination teaches selection responsive to a clipped location .	118
318.	With respect to claim 61, the proposed combination teaches circumscribing selectable regions on the display .	118
319.	With respect to claim 61, whether the Final provides a motivation to make the proposed modification of Ito.	118
320.	With respect to claim 62, whether the new result of accommodating overshoot is obvious.	118

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346.	With respect to claim 73, whether the new results of accommodating each of tremor and drift are obvious.	122
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348.	With respect to claim 73, whether Ito, as combined with Baker, and Golding are combinable.	122
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379. With respect to claim 164, whether Baker teaches **simultaneously** displayed menu
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	387. With respect to claim 164, whether Ito, as combined with Baker, and Golding are combinable.	128
10	388. With respect to claim 164, whether Ito and Lazzaro are combinable.	128

IX. GROUPING OF CLAIMS

Appellant urges that each of the groups listed below and each pending claim not listed in any of the groups stands on its own recitation, each group and each pending claim not listed in any of the groups being considered to be separately patentable for reasons set forth in more detail *infra*.

1. Claim 170, 1, 108, 166, 171, 175, 176
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55. Claim 116
56. Claim 117
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117. Claim 188
5 118. Claim 189
119. Claim 190
120. Claim 191
121. Claim 192
122. Claim 193
10 123. Claim 194
124. Claim 195
125. Claims 196, 197
126. Claim 198
127. Claim 200
15 128. Claim 201
129. Claim 202
130. Claim 203
131. Claim 204
132. Claim 205

X. THE REFERENCES

The following references are relied on by the Examiner:

<u>Reference</u>	<u>Cited herein as</u>
U.S. Patent No. 5,177,328 to Ito et. al.	Ito
25 U.S. Patent No. 4,586,035 to Baker et. al.	Baker
U.S. Patent No. 5,285,265 to Choi	Choi
U.S. Patent No. 4,931,783 to Atkinson	Atkinson
U.S. Patent No. 4,291,198 to Anderson et. al.	Anderson
Golding, V.G; Heneghan, M. J.; "Audio Response Terminal,"	Golding
30 <i>IBM Technical Disclosure Bulletin</i> , vol. 26, no. 10B, March 1984.	
Lazzaro, Joseph J., "Computers for the Disabled," <i>Byte</i> , June, 1993.	Lazzaro

Collectively the above references are referred to in this Amended Appeal Brief as the applied references or applied art.

XI. THE REJECTIONS

5 Claims 1, 19-41, 43-58, 61-80, 82-89, 94, 101-106, 108, and 112-205 stand rejected under 35 U.S.C. §103 as being unpatentable over the applied references. Ito is described in the Final as teaching a plurality of selectable regions each adjacent a side of the polygon of the display. Baker is relied upon for teaching cursor control for selecting a selectable region by moving the cursor within the selectable region. Lazzaro is relied upon for teaching selection in response to a dwell event. 10 Golding is relied upon for teaching a speech synthesizer. Atkinson is relied upon for teaching selection of a submenu option in response to the intersection of the cursor and a selectable region. Choi is relied upon for teaching an indicator showing the remaining time before an activation signal is optionally applied.

15 The Examiner has failed to clearly and specifically state the grounds for rejecting many of the above claims, in spite of the legal requirement to do so. 37 C.F.R. §1.113(b) and *In re Oetiker*, 977 F.2d 1443, 24 USPQ 2d 1443, 1447 (Fed. Cir. 1992) (Plager, J., concurring). Specifically, the Final provides only partial grounds for the rejection of 14 independent claims. The Examiner held that Ito disclosed certain claimed limitations. "Fig. 5 of Ito discloses the display system comprising a display screen (3), means for at least partially delimiting a plurality of selectable regions (25A-25C), and 20 each of the selectable regions outside the display screen and each associated respectively with a displayed menu option, which within [sic] the scope of independent claims 1, 106, 114, 147, 155, 165, 166, 94, 158, 170, 39, 61, 89, 78." (Final, p.6, lines 5-8). While the Examiner does not mean by this statement that these claims are rejected by Fig. 5 of Ito alone (Final, p.7, line 12 - p.8, line 2), the Examiner did not specifically state which references other than Ito meet other limitations of these 25 claims. Appellant petitioned the Commissioner to withdraw the finality of the Final on this basis. This request was denied.

30 Appellant, out of necessity, has inferred the grounds of rejection with respect to the above claims, and addressed all the issues raised on the inferred grounds. This has lengthened this Amended Appeal Brief. Appellant had no choice if he was going to provide a complete appeal brief on an incomplete record.

XII. ARGUMENT

A. Claim Ordering

This Argument section is ordered as follows:

1. issues concerning many claims; and
2. issues concerning individual claims grouped by what selection is responsive to:
 - (a) one or more dwell events or periods of switch activation (independent claims 19, 33, 114, 52, 53, 65, 67, 85, 94, 106, 134, 155, 159, 160, 161, 162, 78, 79, 80, 163, and 170);
 - (b) one or more intersections (independent claims 54, 147, 158, 165, and 198); and
 - (c) one or more selection events (independent claims 39, 61, 63, 72, 73, 74, 76, 89, and 164).

Dependent claims are ordered in a depth first traversal of the claim tree following their parent independent claims.

B. Quotes from Pending Claims

In the Issues section below, quotations marks indicate language from the claim listed in the issue heading, unless otherwise noted.

C. Issues

Issues concerning many claims

1. Whether the Examiner has rebutted Appellant's assertion of discovery of the source of the problem.

Invention may reside in discovering the source of a problem, as well as its solution. *In re* Kaslow, 707 F.2d 1366, 1373, 217 U.S.P.Q. 1089, 1094 (Fed. Cir. 1983). This is part of "the subject matter as a whole" and should always be considered when determining the obviousness of an invention under 35 U.S.C. §103. *In re* Spinnable, 405 F.2d 578, 585, 160 U.S.P.Q. 237, 243 (CCPA 1969).

Appellant invented a menu selection method and apparatus particularly useful for NMD operators. Appellant observed NMD operators attempting computer access. Many NMD operators, especially those with more severe impairments, cannot effectively use the conventional point and click or point and dwell (on-screen keyboard) computer interface (Specification, p.6, lines 5-9) because they cannot point precisely. Appellant isolated two constituent motor problems that contribute to imprecise pointing, specifically overshoot and involuntary movement accompanying voluntary movement (Specification, p.2, line 27 - p.3, line 6; p.13, lines 25-30; p.14, lines 7-18; p.46,

lines 16-27; and p.62, lines 19-29). Appellant's discovery of the sources of the problem of imprecise pointing is nonobvious. Consequently, appellant's claimed method and apparatus for solving this problem satisfies the nonobvious requirement of 35 U.S.C. §103.

The problem of overshoot is solved, at least in part, by the methods and apparatuses of independent claims 1, 19, 33, 39, 52, 61, 63, 65, 67, 70, 71, 72, 73, 74, 78, 79, 80, 89, 94, 106, 114, 147, 155, 158, 159, 160, 161, 162, 163, 164, 165, 166, 170, and 198, and dependent claims 62, 64, 102, 146, 178, and 179, as described in the New Results section above. Appellant urges that each of these claims are patentable and overcome the obviousness rejection on this ground.

Appellant urged that his discovery of the source of the problem supported nonobviousness. (Amendment filed 28 September 1998, Applicant Document No. 445-22, p.7, lines 2-13). The Examiner has not responded to this assertion, has not cited a single reference bearing on the question, and consequently has failed to rebut the presumption of patentability attributed to an admittedly new and useful combination. *In re Glavas*, 230 F.2d 447, 450, 109 USPQ 50,52 (CCPA 1956) interpreting 35 U.S.C. §102. Appellant requests allowance of the above claims on this basis.

2. Whether the applied references teach the particular limitations in claims 21, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, 35, 36, 37, 38, 39, 47, 48, 49, 53, 55, 56, 61, 67, 76, 77, 82, 86, 87, 88, 89, 94, 104, 105, 117, 118, 119, 120, 121, 122, 123, 124, 128, 129, 130, 136, 137, 138, 139, 140, 142, 143, 144, 145, 148, 154, 155, 156, 157, 160, 162, 169, 174, 177, 183, 184, 185, 200, 201, 202, 203, and 205.

It is uncontested that Appellant's claimed invention meets that standard set forth in 35 U.S.C. §101 and therefore is presumptively entitled to a patent under 35 U.S.C. §102, since the Examiner based all rejections on 35 U.S.C. §103. Under 35 U.S.C. §103, the burden is on the Examiner to make a *prima facie* case of obviousness. The Examiner did not address limitations in each of the claims listed in the heading of this issue. The specific limitation of each of these claims which is not mentioned in the Final is noted in the argument below for each group of claims. In the absence of an art rejection, each of these claims is *prima facie* allowable.

The Final addresses limitations in independent claims only. The Examiner states conclusorily that all dependent claims are rejected for the "reasons set forth in the rejection above". (Final, p.6, lines 9-11).

3. Whether Ito and Lazzaro are combinable.

Ito and Lazzaro are not combinable for four reasons. First, one of ordinary skill in the art would not combine them because they relate to separate fields. Ito's disclosure "relates to an information processing apparatus for inputting data (including commands, items, etc.) by an **integrated display/input device**" (Ito col. 1, lines 7-10, emphasis added). Lazzaro's disclosure relates to equipment adaptations "for motor-impaired workers **unable to type on a standard keyboard**" (Lazzaro, p.62, col. 1, lines 33-35). Lazzaro discloses a Pointer Systems optical head pointer (Lazzaro, p.62, lines 11-12). The head pointer tracks the user's head movement by emitting light and following its reflection off a reflective surface on the user's head. Lazzaro's figure on p.62 shows the user wearing headgear and, on top of the computer display, the optical transceiver. As is evident from Lazzaro's figure on p.62, the head pointer is completely separate from the display, i.e. **not integrated** with it. These are separate and distinct fields.

The second reason Ito and Lazzaro are not combinable is that Ito and Lazzaro are directed to mutually exclusive user populations and therefore would not be combined by one of ordinary skill in the art. Ito's invention relates solely to an **integrated display/input device**. Ito describes the field of his invention as "an information processing apparatus for inputting data (including commands, items, etc.) by using an **integrated display/input device**". (Ito, col. 1, lines 6-10, emphasis added). The **only** device Ito discloses is an integrated display/input device. (Ito Fig. 1, 4, 5, 8; col. 1, lines 27-31; col. 1, line 39; col. 1, line 50; col. 2, lines 13, 21, 34, 39, 66-68; col. 3, lines 9-10, 22-23, 39, 41, 45, 58, 62; col 4, lines 16, 24, 37, 39, 56, 61; col. 5, lines 7, 14; col. 7, lines 60-66). **All** the listed objects of Ito's invention related to an integrated display/input device. (Ito, col. 2, lines 4, 8, 11.) Ito does not disclose or suggest the use of an input device separate from the display device. Lazzaro's discloses adaptive equipment "for motor-impaired workers **unable to type on a standard keyboard**" (Lazzaro, p.62, col. 1, lines 33-35). A user of the on-screen keyboard disclosed by Lazzaro is physically unable to use the integrated display/input device of Ito.

The third reason Ito and Lazzaro are not combinable is that these references are in conflict. Ito teaches selection regions **outside** the display screen and against adding selection regions on the display screen, as discussed below in connection with claim 19's selectable regions **on** the display. This is critical to achieving Ito's intended result. Contrary to Ito, Lazzaro teaches displaying all key images **on** the display, as shown in the figure on Lazzaro, p.62. Displaying key images on the display is critical to Lazzaro. One of ordinary skill in the art would not combine such conflicting references.

The fourth reason Ito and Lazzaro are not combinable is that the combination renders Ito inoperable for one of its functions: cancel. Ito uses stylus switch closure **outside** the location

detection range of the tablet to signal a cancel command (Ito, Fig. 6; col. 4, lines 51-59; col. 6, lines 3-8), in accord with one of the objects of Ito's invention, increasing the quantity of data on a single screen (Ito, col. 2, lines 6-9 and 38-49). This is possible because Ito's stylus pen offers the advantage of being active outside the location detection range of the tablet. Ito thus uses selection **without** coordinate detection. Selection by dwell **requires** coordinate detection. Combining dwell selection with Ito renders Ito inoperable for the cancel command and compromises Ito's purpose of increasing the quantity of data on a single screen. "Where a reference would have been inoperable for its intended purpose if modified to show the claimed invention, then it does not establish prima facie obviousness because it effectively teaches away from the claimed invention." *In re Gordon, supra*.

The Examiner extracts from Lazzaro selection by dwell of both on-screen and off-screen selectable regions. Lazzaro, however, discloses only selection by dwell from an **on-screen** keyboard. Selecting a region by dwell **requires** coordinate detection. Consequently, in Lazzaro, there is no selection **outside** the on-screen keyboard. In contrast, certain pending claims require selection by dwell of regions **outside** the display. Independent claim 170 locates "each of the selectable regions **outside** the display screen", independent claim 39 locates "each of the selectable regions **outside** the display area", independent claim 94 includes "a delimit device completely delimiting an invisible selectable region **outside** the display screen", independent claim 106 requires "each of the selectable regions including a subregion **outside** and adjacent the display screen", and independent claim 78 specifies "each of the selectable regions including an invisible subregion **outside** the display area".

The Examiner explicitly combines Ito with Lazzaro in rejecting claims 19, 52, 53, 54, 63, 65, 70, 72, and 79. (Final, p.5, lines 12-13). The Examiner implicitly combines Ito with Lazzaro to meet the selection responsive to a period or quantity equalling or exceeding another period or quantity found in claims 1, 20-38, 66-69, 78, 80, 82-88, 94, 101-106, 108, 112-146, 155-157, 159-163, 166, 169-197, 199-202, and 204-205.

4. Whether Ito and Atkinson are combinable.

In the Final, the Examiner concluded that claim 33 was obvious in view of a proposed a combination of a modification of Ito with selected elements of Lazzaro and Atkinson. Ito cannot be properly combined with Atkinson. Ito teaches static commands located outside the display, as shown in Ito Fig. 5. "The upper surface of the casing of transparent tablet 2 **bears labels** indicating the commands assigned to the regions 25A, 25B and 25C." (Ito, col. 4, lines 36-38, emphasis added). Because these commands are static, they should be "used commonly in a plurality of application

programs.” (Ito col. 8, lines 16-17). Static commands are integral to the Ito's invention, in accord with Ito's purposes of increasing the quantity of data to be displayed on a single screen, i.e. moving menus **off** the screen, reducing the number of icons displayed by the display device, and using the entire display area to display given contents, as discussed in connection with claim 19. Moving
5 **menus** onto the display is contrary to Ito's express purpose. Thus Ito teaches away from this modification, and therefore cannot be combined with Atkinson which discloses and relies upon **on-screen** menus. *In re Gordon, supra*.

The Examiner combines Ito as modified with Fig. 1B which shows a pull-down menu occupying substantial screen space. Indeed Atkinson's invention is directed at keeping the pull-down
10 menu "constantly accessible" (Atkinson, col. 5, line 40). Moreover, Atkinson teaches against saving space by overlapping the pull-down menu and the menu bar. "Overlapping of the menu bar should be prevented because the detached menu window will obscure command options on the menu bar if overlapping occurs." (Atkinson, col. 6, lines 52-55). Atkinson thus clearly conflicts with Ito's purpose that "the entire display area can be used to display given contents." (Ito, col. 7, lines 12-13).

15 The Examiner states that it is well known in the art that a menu option may be associated with a plurality of submenus, and therefore is not novel. (Final, p.4, line 6). Whether a menu hierarchy is novel or not is irrelevant under 35 U.S.C. §103 which requires analysis of obviousness of a claim as a whole, not novelty of an element thereof.

20 None of applied references disclose or suggest a **perimeter** menu hierarchy, as disclosed in the present Specification, p.42, lines 1-18, p. 44, lines 21-29.

Appellant requested, pursuant to under 37 C.F.R. §1.107(b), that the Examiner provide a prior art reference or affidavit evidencing the required incentive to combine Ito with Atkinson (Amendment, Applicant Document No. 032-23, filed 28 September 1998). The Examiner has not responded to that request.

25 In the Final the Examiner explicitly applies a combination of Ito as modified and Atkinson in rejecting claims 33 and 161.

5. Whether the subject matter of each pending claim, taken as a whole, would have been obvious.

30 Appellant urges that the **combinations** of each pending claims, taken as a whole, would have been unobvious at the time the invention was made to a person having ordinary skill in the art.

Under 35 U.S.C. §103, not only must each proposed modification or combination must be

obvious, but the entire chain of modification and combinations must be obvious. A failure of any link in this chain is fatal to the *prima facie* case of obviousness since 35 U.S.C. §103 requires that a patent be granted unless the invention "as a whole" would have been obvious.

Below are listed the modifications and combinations determined to be obvious by the Examiner. Some of them are discussed in more detail below in connection with a specific claim or claims.

- (a) disintegrate the integrated input/display device of Ito;
- (b) delete Ito's stylus pen;
- (c) delete from Ito's functionality selection outside of the coordinate detection range of the input device;
- (d) delete selection by click;
- (e) add a pointer;
- (f) add selection by dwell;
- (g) add selection regions to the LCD display range shown in Ito's Fig. 2 until the selection regions together at least partially circumscribe a first region on the LCD;
- (h) add selection regions from outside Ito's LCD display range, shown in Ito's Fig. 12, to Fig. 2 as modified;
- (i) locate each selection region outside the LCD display range adjacent one of the selection regions on the LCD display range; and
- (j) meld each selection region on the LCD with the adjacent selection region outside the LCD to create a single selection region.
- (k) move Ito's labels from outside the screen to on the screen;
- (l) make Ito's labels dynamic;
- (m) replace Ito's commands with a sequence symbols, e.g. the Picture Communication Symbols symbol set; and
- (n) add a voice output device.

Not all the listed modifications and combinations are necessary to achieve the apparatus of every claim. However, since the Examiner has not allowed a single claim, the Examiner has determined that **all** of them, and their results are obvious.

Appellant argues that the **chain** of modifications and combinations supporting the rejection of each claim is nonobvious.

Independent claim 19 and its dependent claims

The apparatus of claim 19 is described below, proceeding from the outside of the structure toward its center. The apparatus for use with a human interface system including a display. A first polygon intersects the display. Thus the first polygon may be larger than the display, may be the same size as the display, or may even be smaller than the display. Each of a plurality of selectable regions lies within the first polygon and adjacent a side of the first polygon. Within the plurality of selectable regions, i.e. at least partially circumscribed by the selectable regions, is a region on the display.

Each selectable region is associated respectively with a menu option. The apparatus further includes movement related signal receiving means for receiving a movement related signal responsive to movement of a user. The movement related signal indicates successive locations. A first cursor may be displayed on the display and moved responsive to successive locations indicated by a movement related signal. The apparatus includes control means for: (1) moving the first cursor within the first polygon responsive to the successive locations indicated by the movement related signal; (2) **confining** at least part of the first cursor to the first polygon; and (3) in response to a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of the durations of one or more successive periods of intersection of the first cursor and one of the selectable regions, selecting the menu option associated with the intersected selectable region.

Independent claim 19 stands rejected under 35 U.S.C. §103 based upon the combination of Ito and Lazzaro (Final, p.5, line 12-13).

Figures 26 and 27 of the present Specification (reproduced in Appendix III) illustrate one embodiment of a confiner.

6. With respect to claim 19, whether the new result of **accommodating overshoot** is obvious.

The determination of obviousness under 35 U.S.C. §103 requires consideration of the problem solved by the claimed invention. *In re Newell*, 891 F.2d 899, 902, 13 USPQ 2d 1248, 1250 (Fed. Cir. 1989). A functional characteristic may constitute a material difference over prior art. *In re Mills*, 916 F.2d 680, 16 USPQ 2d 1430 (Fed. Cir. 1990).

The apparatus of independent claim 19 solves a problem not solved by any of the applied art alone or in combination: overshoot. Many users with impaired ability to stop motion, common in cerebral palsy, tend to overshoot their targets, as described in the Summary of Invention section

above. The claimed structure, in concert with the means for confining the first cursor to the first polygon, allows the user to overshoot the intended selectable region with the movement related signal, and **still select it**. This new result flows from the synergy between the polygon, the confining function of the control means, and the location of the selectable regions.

5 The language of claim 19 explicitly incorporates this result. The claim states that the apparatus is "for selecting a menu option associated with an **overshot** selectable region **on the display**".

10 The combination proposed in the Final does not allow a user to select an **overshot** selectable region **on** a display, in part because it lacks the control means for confining the first cursor to the first polygon. This structural difference between the proposed combination and the apparatus of claim 19 is explored below under the issue entitled "whether Ito teaches selectable regions adjacent a confiner".

15 A new combination of old elements is nonobvious and patentable where there are unexpected or unusual new results. *United States v. Adams*, 383 U.S. 39, 51, 148 USPQ 479 (1966). The combination of claim 19 is admittedly new; the claim was rejected solely on obviousness grounds under 35 U.S.C. §103, not on anticipation grounds under 35 U.S.C. §102. The new results, including accomodating overshoot, are evidenced by Video Tape described above. The ability of an individual having Ray's diagnoses and motor abilities to use the prototype is an unexpected result.

20 The Final does not address this new result of the claimed structure.

- 20 7. With respect to claim 19, whether the new results of **accommodating each of tremor and drift** are obvious.

25 In the claimed apparatus the selectable regions are, in effect, unconstrained by the display's limited size. Each selectable region is therefore very large, even infinite, being in effect unbounded where it is adjacent the first polygon. Due to their large size, these selectable regions accommodate the problems of both tremor and drift, as described in the Summary of Invention section above.

30 The determination of nonobviousness requires consideration of properties inherent in the claimed apparatus, here accommodating tremor and drift. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); *Weather Engineering Corp. of America v. United States*, 204 USPQ 41 (Ct. Cl. 1979).

 The Final does not address this new result of the claimed structure.

8. With respect to claim 19, whether the new result of **simultaneously** accommodating impaired

fine motor control and providing space for an application program window is obvious.

The combination proposed by the Examiner lacks important functionality for NMD operators. Neither Ito nor Lazzaro accommodates impaired fine motor control. Ito fails to do so because Ito's selection regions are "slight" in width. (Ito col. 1, lines 50-53). In Lazzaro's disclosure (figure on Lazzaro, p.62), each key image is very small. At the size shown, these keys are very difficult for many NMD operators to select. (Specification, p.6, line 5-14). Furthermore Lazzaro's on-screen keyboard occupies a significant portion of the display, space which cannot be used by a concurrently running application program, and, by occupying a contiguous area, restricts the size and shape of the application program window. Increasing the size of the key images **decreases** the space available for the application program window.

In the claimed apparatus, the selectable regions are very large. **Simultaneously**, the apparatus provides a large contiguous space for the output of an application program because "the plurality of selectable regions together at least partially circumscrib[e] a region on the display". This result, described in the New Results section above, is not achieved by any of the applied art.

The Final does not address this new result of the claimed structure.

9. With respect to claim 19, whether the new result of **increased speed** of selection is obvious.

The functional effect in the claimed apparatus of confining the first cursor to the first polygon is to expand the effective width of the selectable regions to infinity (Specification, p.46, lines 1-8). The selectable regions are within and adjacent the first polygon. When the user overshoots the selectable region, the control means confines the first cursor to the first polygon.

In accord with Fitts' Law, as target width increases, movement time decreases, resulting in substantially increased speed of selection. Because Fitts' Law operates within limits and includes a constant which is not a function of target width, movement time does not approach zero even though target width is infinite.

In the claimed apparatus, the selectable regions are, in effect, unconstrained by the display's limited size. This effect results from the synergy between the selectable regions, the display, the first polygon and the confining function of the control means. The claimed apparatus includes "means for displaying a plurality of selectable regions within a first polygon intersecting the display", and locates "each selectable region adjacent a side of the first polygon". Although a user overshoots the intersected selectable region, the control means "confin[es] at least part of the first cursor to the first polygon". Because the intersected selectable region is "adjacent a side of the first polygon", at least

part of the first cursor continues to intersect the overshoot selectable region.

The width of Ito's selection regions is, in contrast, constrained by the difference between the dimensions of the coordinate detection range and the display range and is slight. "[T]he coordinate detection range of the transparent tablet 2 of display/input device 1 is **slightly** greater than the display range of LCD 3." (Ito col. 1, lines 50-53, emphasis added).

The magnitude of the difference in size between Ito's selection regions and the selection regions outside the display screen leads to an important functional difference: the selectable regions of this claim are significantly faster to select than the Examiner's proposed combination of prior art, as described in the New Results section above.

The Final does not address this new result of the claimed structure.

10. With respect to claim 19, whether the new result of **decreasing error rate** is obvious.

The issue has already been discussed in the New Results section above.

The Final does not address this new result of the claimed structure.

11. With respect to claim 19, whether Ito teaches selectable regions **adjacent** a confiner.

In claim 19, unlike Ito or any of the applied art, the selectable regions are **adjacent a confiner**. In claim 19 this confiner includes the control means and the first polygon. The control means "confin[es] at least part of the first cursor to the first polygon". Each of the selectable regions is "within a first polygon" and "**adjacent** a side of the first polygon", i.e. adjacent the confiner. None of the applied art discloses or suggests selectable regions adjacent a confiner.

Ito does not disclose a confining element **adjacent** the display. The Examiner states that "Ito in Fig. 9, teaches the user moves the cursor for pointing at a displayed data input location, wherein the displayed data input locations, e.g., displayed keyboard, having border confining the location **to the display area**" (Final, p.9, lines 10-12, emphasis added). This is incorrect. Ito's Fig. 9 is "a view for explaining an example of a display image on LCD 3" (Ito, col. 3, lines 17-18). LCD 3, shown in Ito's Fig. 2, has a display range **smaller than and wholly within** the coordinate detection range of tablet 2. "[P]art of the coordinate detection area of the transparent table 2 (generally, a peripheral part of tablet 2) extends **beyond** the display range of the LCD 3" (Ito, col. 1, lines 53-56, emphasis added).

Assuming *arguendo* that the **housing** of Ito's integrated display/input device confines the stylus to the coordinate detection range, the housing does not confine the location **to the display area** as stated in the Final because the display area is smaller than and wholly within the coordinate detection range.

This structure is central to Ito's invention, which is directed at "making use of that part of the coordinate detection area which does not overlap the display area" (Ito, col. 2, lines 28-30).

12. With respect to claim 20, whether the Final provides a motivation to make the proposed modification of Ito.

In the Final, the Examiner concludes that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify each of the selectable region [sic] in Fig. 2 of Ito to be adjacent a side of the polygon on the display screen, and the plurality of selectable regions together at least partially circumscribing a region of the display since the number of selectable regions and the location of the selectable regions are the desirable choice based on the desired commands to be allocated to the selection regions (note col. 7, lines 32-40 of Ito)." (Final, p.2, lines 18-23, underline and bold emphasis added).

The section of Ito referred to above by the Examiner states: "The number of selection regions 25 is not limited to three. Desired commands can be allocated to the selection regions by rewriting the command names (codes) set in the command indication area 123 of the RAM 12. For example, function keys [F1] to [F10] used in a conventional computer keyboard may be arranged, as shown in FIG. 12, and desired command and processing functions may be allocated to the function keys, as shown in FIG. 13." (Ito, col. 7, lines 32-40). This section contains no suggestion or justification for modifying the **location** of Ito's selection regions, or for moving selection regions from outside the display, as shown in Ito's Fig. 12, **onto** the display.

The Examiner's stated rationale for so modifying Ito, underlined in the above quote from the Final, is incomprehensible. In making a rejection under 35 U.S.C. §103, the Examiner has a duty to clearly and specifically state the grounds for the rejection. 37 C.F.R. §1.113(b) and *In re Oetiker*, 977 F.2d 1443, 24 USPQ 2d 1443, 1447 (Fed. Cir. 1992) (Plager, J., concurring). This includes the motivation to make each proposed modification of the prior art. Because the Examiner has failed to provide a comprehensible rationale, the Appellant is unable to contest the stated rationale.

Appellant requested, pursuant to under 37 C.F.R. §1.107(b), that the Examiner provide a prior art reference or affidavit evidencing the required incentive to modify Ito (Amendment, Applicant Document No. 032-23, filed 28 September 1998). The Examiner has not responded to that request.

Ito is the primary reference relied on by the Examiner in the rejection. Given Ito's inapplicability, as described above, the rejection of each claim having selectable regions **on** the display, display screen, or display area, should be reversed.

13. With respect to claim 20, whether Ito teaches a circumscribing plurality of selectable regions on the display.

Claim 20, depending from claim 19, specifies that "the first polygon is located on the display". Since the selectable regions are "within a first polygon" (language of parent claim 19), they are entirely on the display.

In the Final, the Examiner concedes that "Fig. 2 of Ito does not show each of the selectable region [sic] adjacent a side of the polygon on the display, and the plurality of selectable regions in Fig. 2 of Ito do not together at least partially circumscribing [sic] a region of the display" (Final, p.2, lines 14-16). The Examiner then modifies Ito's Fig. 2 by moving Ito's selection regions in Fig. 12 from outside the display onto the display. "The examiner is using this teaching of the location and the position of the selectable regions ... shown in Fig. 12 of Ito to modify the display/input device in Fig. 2 of Ito." (Final, p.6-7, emphasis added). To meet the limitations of claim 19, the Examiner adds selection regions until the selection regions together partially circumscribe a region on the display. This modification reduces the area on the display available to display information. Ito explicitly teaches away from adding a single selection region to Fig. 2, and from adding selection regions until they together partially circumscribe a region on the display.

A reference teaches away when a person of ordinary skill, upon reading the reference, ... would be led in a direction divergent from the path that the Appellant took. *In re Gurley*, 27 F.2d 551, 31 USPQ 2d 1130, 1131 (Fed. Cir. 1994). Ito's teaching is not merely divergent from the Appellant's path; it is 180 degrees opposed to it.

Ito's starting point, shown in Fig. 2, is a conventional integrated display/input device having menu items thereon. Ito identifies and addresses a problem with this conventional device: "the actually used display range of the LCD 3 is limited to the display range excluding the area for displaying the icons." (Ito, col. 1, lines 61-63).

Ito's purpose is that "the entire display area can be used to display given contents." (Ito, col. 7, lines 12-13, emphasis added). One of Ito's goals is to reduce the number of icons displayed by the display device, allowing the screen of the display device to be used effectively. (Ito col. 2, lines 31-33, emphasis added). One of the objects of Ito's invention is to "provide an integrated display/input device wherein the quantity of data to be input/displayed on a single screen is increased." (Ito col. 2, lines 6-9, emphasis added.)

Ito accomplishes his goals by moving selection regions off the display. Ito's central teaching is to move the menu items located on the display range in Fig. 2 outside the display range, as shown

in Fig. 12.

Contrary to Ito's teaching to reduce the number of icons displayed by the display device (Ito col. 2, lines 31-33), the Examiner's modification increases the number icons displayed by the display device.

5 The **line of development** flowing from Ito is increasing the quantity of data to be input/displayed on a single screen. The Examiner must consider the line of development. *W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1550-51, 220 USPQ 303, 311 (Fed. Cir. 1983), *cert. denied*, 469 US 851 (1984), MPEP 2141.02. Contrary to the controlling law, the Examiner explicitly states in the Final that she considers the line of development to be **irrelevant**. "The examiner is using
10 this teaching ... shown in Fig. 12 of Ito to modify the display/input device in Fig. 2 of Ito.... The menu items locate [sic] at outside the display in Fig. 12 of Ito is **irrelevant** since Fig. 2 of Ito teaches the plurality of selectable regions are *on* the display screen." (Final, p.7, lines 2-3, bold emphasis added).

15 Furthermore, Ito implicitly teaches against modification of Fig. 2 by moving menu items onto the display, since this modification frustrates the purpose of Ito's invention described above, particularly that "the entire display area can be used to display given contents" (Ito, col. 7, lines 12-13). "Where a reference would have been inoperable for its intended purpose if modified to show the claimed invention, then it does not establish prima facie obviousness because it effectively teaches away from the claimed invention." *In re Gordon, supra*.

20 It is the policy of the Patent Law to extend patent protection to just the sort of innovation described in the instant claim. Appellant, in part by contradicting one of the explicit purposes of the prior art, Ito in this case, and doing what the prior art teaches should not be done, has achieved new results, as evidenced by the Video Tape.

25 14. With respect to claim 20, whether Ito teaches selectable regions **adjacent** a confiner and **on** the display.

In claim 20, the first cursor is confined to the display because the first polygon is located on the display.

30 In Ito, this is not the case. Assuming *arguendo* that the **housing** of Ito's integrated display/input device confines the stylus to the coordinate detection range, the housing does not confine the location to the **display area** because the display area is smaller than and wholly within the coordinate detection range. This structure is central to Ito's invention, which is directed at "making use of that

part of the coordinate detection area which does not overlap the display area” (Ito, col. 2, lines 28-30).

- 5 15. With respect to claim 21, whether the proposed combination discloses “at least one of the selectable regions intersecting the at least partially circumscribed region”.

 The claimed structure is illustrated in Figure 32 of the present Specification and is described on p.63, lines 24-30.

 The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

- 10 16. With respect to claim 23, whether the proposed combination teaches: (a) **switching** between (b) **two** confining polygons (c) responsive to an **intersection**.

 The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

- 15 17. With respect to claim 24, whether the proposed combination teaches: (a) **switching** between (b) **two** confining polygons (c) responsive to a **distance** between two of the successive locations.

20 The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

18. With respect to claim 25, whether the proposed combination teaches: (a) **switching** between (b) **two** confining polygons (c) responsive to an **angle** indicated by three of the successive locations.

25 The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

19. With respect to claim 26, whether the proposed combination teaches two confining polygons **intersecting** one another.

30 The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

20. With respect to claim 27, whether the proposed combination teaches two confining polygons, one **including** all the area of the other.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

21. With respect to claim 82, whether the proposed combination teaches: (a) **switching** between (b) **two** confining polygons (c) responsive to a sensor signal indicative of an actual or attempted **muscle activation**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

22. With respect to claim 28, whether the proposed combination teaches selection responsive to a **distance** of overshoot.

When one of the successive locations indicated by the movement related signal overshoots the first polygon, there is a distance between the location and the first cursor which is confined to the first polygon. In claim 28, the selection of the control means is responsive to this distance.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

23. With respect to claim 29, whether the proposed combination teaches selection responsive to a **distance** of overshoot.

When one of the successive locations indicated by the movement related signal overshoots the first polygon, there is a distance between the location and the intersected selectable region which is within the first polygon. In claim 29, the selection of the control means is responsive to this distance.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

24. With respect to claim 32, whether the proposed combination teaches any of the enumerated icons.

The Examiner did not specifically state why this claim was rejected, but did state generally that "it is obvious to modify the device of Ito as modified to display **any kinds** of displayed

sequences on the display screen since it is the function of a display to display information [sic].” (Final, p.11, lines 12-14, emphasis added). According to this rationale, the obviousness *vel non* of what the icon represents and of the claim as a whole, is irrelevant. This is contrary to 35 U.S.C. §103, and therefore an improper ground for rejection.

None of the enumerated icons are disclosed or suggested in any of the applied references.

Independent claim 33 and its dependent claims

Independent claim 33 stands rejected under 35 U.S.C. §103 based upon the combination of Ito as modified, Lazzaro and Atkinson (Final, p.5, line 14-15).

25. With respect to claim 33, whether the proposed combination teaches selectable regions **partially on and partially outside** the display area.

Assuming *arguendo* that all the Examiner’s proposed modifications and combination are proper, the resulting combination still lacks the structure of the claimed apparatus. In claim 33, “each of the first selectable regions includ[es] a first subregion **adjacent** the display area **and** a first subregion **on** the display area”.

The Examiner starts with Ito’s Fig. 2. To show the structure of claim 33, three modifications of Ito’s Fig. 2 are required:

- (a) **add** selection regions to the LCD display range shown in Ito’s Fig. 2 until the selection regions together at least partially circumscribe a first region on the LCD;
- (b) **add** selection regions from outside Ito’s LCD display range, shown in Ito’s Fig. 12, to Fig. 2 as modified;
- (c) **locate** each selection region outside the LCD display range adjacent one of the selection regions on the LCD display range; and
- (d) **meld** each selection region on the LCD with the adjacent selection region outside the LCD to create a single selection region.

The Examiner concludes that modification (a) is obvious. “[I]t would have been obvious to one having ordinary skill in the art at the time the invention was made to modify each of the selectable region in Fig. 2 of Ito to be adjacent a side of the polygon on the display, and the plurality of selectable regions together at least partially circumscribing a region of the display ...” (Final, p.2, lines 15-18). The Examiner proposes no further modifications. Consequently the resulting device

lacks (1) subregions **adjacent** the display area, (2) subregions adjacent the display area and also **adjacent** a subregion **on** the display area, and (3) the **union** of a subregion adjacent the display area and a subregion on the display area into a **single** selectable region.

5 In the claimed apparatus, each subregion adjacent the display is paired with a subregion on the display: “each of the first selectable regions **includ[es]** a first subregion adjacent the display area **and** a first subregion on the display area area”. In the claimed apparatus, it is the **union** of the subregions that is associated with a menu option: “each of the first **selectable regions** [is] associated respectively with one of the menu options”.

10 Ito does not disclose or suggest the association of a **union** of subregions with a menu option. In Ito’s Fig. 2, each selection region **on the LCD** is associated with a menu item. In Ito’s Fig. 12, each selection region **outside the LCD** is associated with a menu item.

The Final does not propose modifications (b), (c), or (d). Consequently, the Final also does not provide a reference or motivation for any of these modifications.

15 Ito’s Fig. 12 does not teach the claimed structure. It does not disclose or suggest selectable regions partially on and partially outside the display area. In Fig. 12, the labels F1-F10 are not **selectable**.

The claimed structure, in cooperation with other elements of claim 33, provides new results, enumerated below.

20 26. With respect to claim 33, whether the new results of accomodating **overshoot** is obvious.

The structure of claim 33 accommodates overshoot. Each of the selectable regions includes a subregion adjacent the display area and a subregion on the display area. Thus each selectable region straddles the edge of the display area, allowing a user to overshoot the subregion on the display area and still select the selectable region including the overshoot subregion.

25 The issue has already been discussed in connection with claim 19.

27. With respect to claim 33, whether the new results of **accommodating each of tremor and drift** are obvious.

30 In the claimed apparatus each of the first selectable regions are unconstrained by the display’s limited size because “each of the first selectable regions **includ[es]** a first subregion **adjacent** the display area”. Consequently, each first selectable region is potentially very large. Due to their large size, these selectable regions accommodate both tremor and drift, as described in the New Results

section above.

The issue has already been discussed in connection with claim 19.

28. With respect to claim 33, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious.

In the claimed apparatus, the selectable regions are potentially very large. **Simultaneously**, the apparatus provides a large contiguous space for the output of an application program because “the plurality of selectable regions together at least partially **circumscrib[e]** a region on the display”.

The issue has already been discussed in connection with claim 19.

29. With respect to claim 33, whether the new result of **increased speed** of selection is obvious.

The functional effect in the claimed apparatus of is to expand the effective width of each on-screen target. “[E]ach of the first selectable regions includ[es] a first subregion **adjacent** the display area and a first subregion on the display area”. Thus each selectable region straddles the edge of the display area. The effective width of the target is the width of the **sum** of the widths of the subregion on the display and the subregion adjacent the display.

In accord with Fitts' Law, as target width increases, movement time decreases, resulting in substantially increased speech of selection.

The issue has already been discussed in connection with claim 19.

30. With respect to claim 33, whether the new result of **decreasing error rate** is obvious.

The issue has already been discussed in the New Results section above.

The Final does not address this new result of the claimed structure.

31. With respect to claim 33, whether the proposed combination teaches selectable regions **on** the display area.

This issue has already been discussed in connection with claim 19.

32. With respect to claim 33, whether the Examiner's rejection evidences improper **hindsight**.

The Examiner is apparently using the present Specification as a guide through the prior art for reconstructing the claimed invention. This is evident from the Examiners particular modifications of selected elements of the applied references. For example, Atkinson is exclusively directed to **linear**

menus. (Atkinson, Figures 1b, 2, 3a, and 3b, col. 1, lines 42-52, col. 2, lines 29-34, col. 2, lines 67 - col. 3, line 2, col. 3, lines 66-68, col. 4, line 63, col. 5, lines 60-65, col. 6, line 28). Assuming *arguendo* that Atkinson can properly be combined with the proposed combination of Ito as modified and selected elements of Lazzaro, the most natural combination would be a menu window containing
5 a **linear menu** of command items on the display. This combination lacks the functionality of the structure claimed in claim 33. Individuals with impaired motor control have great difficulty selecting from linear menus, and thus would not be able to use such a menu window.

With the benefit of hindsight, the Examiner molds the teaching of Atkinson to meet the limitations of the claimed invention, discarding what is inconvenient. “The **linear** menus of Atkinson
10 is not modified into Ito’s menu option” (Final, p.10, lines 4-5, emphasis added).

Another possible combination of Ito and Atkinson, eschewed by the Examiner, is to move Atkinson's menu outside the display, as taught by Ito. The impracticality of this combination is immediately apparent and illustrates the inappropriateness of combining these references. The user must memorize a complex menu hierarchy. Suppose he remembers the location of the Edit
15 command option. Once he selects Edit, he must remember where the Undo, or Cut, or Copy command item resides in the next level of the menu hierarchy. The reason Ito disclosed only one level for his command menu is thus apparent: a menu outside the display places a memorization burden on the user. Ito recognized this drawback and proposed that the commands in the menu should be “used commonly in a plurality of application programs.” (Ito col. 8, lines 16-17). The
20 present invention according to claim 33 overcomes this drawback in Ito by doing what Ito teaches against: placing a plurality of selectable regions on the display area, which “together at least partially circumscribing a first region on the display area”.

33. With respect to claim 34, whether the proposed combination teaches selection of a character
25 from a **character hierarchy**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references. In particular, the figure on p.62 of Lazzaro shows an on-screen keyboard. Each character of the on-screen keyboard is individually selected. There is no menu hierarchy as claimed.

34. With respect to claim 35, whether the proposed combination teaches any of the enumerated
30 characteristics.

The Final does not address the claimed limitation or combination. None of the applied references disclose or suggest any such commonality among options in a menu.

35. With respect to claim 36, whether the proposed combination teaches distributing perimeter submenu options responsive to **frequency of use**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

36. With respect to claim 37, whether the proposed combination teaches the claimed **relationship between screen distance and frequency of use**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

37. With respect to claim 38, whether the proposed combination teaches the claimed **relationship between the position of a character and the position of a submenu option**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

Independent claim 114 and its dependent claims

Independent claim 114 stands rejected on the basis of Ito and other, unspecified, art. (Final, p.6, lines 5-8). No art other than Ito is clearly cited against this claim in the Final, as required by 37 C.F.R. §1.113(b).

Independent claim 114 is directed to a voice output system comprising: (a) a display screen including a working region with a periphery; (b) a movement related signal receiver for receiving a movement related signal indicating a location with respect to the display screen responsive to user movement by a user, the user movement indicating a potential user selection; (c) a delimit device; and (d) a voice output device. The delimit device is for delimiting selectable regions adjacent the periphery of the working region, each of the selectable regions selectable by the user and having an external boundary wherein the external boundary includes the side of the selectable region furthest from the working region. Each selectable has either a confiner for preventing the movement related signal indicating the location from moving beyond the external boundary of the selectable region or has an activation area extending beyond the external boundary of the selectable region and beyond the

display screen. Each of the selectable regions is associated respectively with and simultaneously displays a first sequence of one or more characters, a first sequence of one or more words, or a first sequence of one or more symbols representing the first sequence of one or more words. The voice output device is for speaking the first sequence of one or more characters and/or words associated with a first particular selectable region responsive to a first intersection of the movement related signal and the first particular selectable region or the activation area associated therewith, thereby providing the user with the ability to select the first particular selectable region while **overshooting** the first particular selectable region or by providing a confiner to the first particular selectable region for the movement related signal.

Independent claim 114 covers at least two distinct embodiments, depending upon the size of the working region relative to the display screen. In the first embodiment, the working region is smaller than the display screen. Since the selectable regions are outside the working region and adjacent the periphery of the working region, they are, at least in part, **on** the display screen. In the second embodiment, the working region is the same size as the display screen. Since the selectable regions are outside the working region, they are **outside** the display screen.

It is believed that both embodiments are patentable and therefore the claim is patentable. The reasons each of these embodiments is not obviousness is discussed below.

38. With respect to claim 114, whether the new result of **accommodating overshoot** is obvious.

Claim 114 explicitly claims the new result of accommodating overshoot. According to the "thereby" clause of the claim, the voice output system "provid[es] the user with the ability to select the first particular selectable region while **overshooting** the first particular selectable region or by providing a confiner to the first particular selectable region for the movement related signal". According to the claim, the effective of area of each selectable region is expanded by "having either a confiner for preventing the movement related signal indicating the location from moving beyond the external boundary of the selectable region or having an activation area extending beyond the external boundary of the selectable region and beyond the display screen".

This issue has already been discussed in connection with claims 19 and 33.

39. With respect to claim 114, whether the new result of **increased speed** of selection is obvious.

In the claimed apparatus, the effective width of each selectable regions is greatly expanded by either one of two structures: (1) a confiner for preventing the movement related signal from moving

beyond the external boundary of the selectable region, or (2) delimiting an activation area extending beyond the display screen. In either case, the result is increased speed of selection, in accord with Fitts' Law. Fitts' Law has already been discussed in the New Results section above and in connection with claims 19 and 33.

40. With respect to claim 114, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious. This issue has already been discussed in connection with claims 19 and 33.

41. With respect to claim 114, whether the new results of **accommodating each of tremor and drift** are obvious. The issue has already been discussed in connection with claims 19 and 33.

42. With respect to claim 114, whether the new result of **decreasing error rate** is obvious. The issue has already been discussed in the New Results section above. The Final does not address this new result of the claimed structure.

43. With respect to claim 114, whether Ito teaches selectable regions **adjacent a confiner**. This issue has already been discussed in connection with claim 19.

44. With respect to claim 114, whether Ito and Baker are combinable. 37 C.F.R. §1.113(b) requires that the Examiner **clearly** state the reasons supporting the rejection. The Examiner has failed to do so with respect to claim 114.

The Final states that "Fig. 5 of Ito discloses the display system comprising a display screen (3), means for at least partially delimiting a plurality of selectable regions (25A-25C), and each of the selectable regions outside the display screen and each associated respectively with a displayed menu option, which [sic] within the scope of independent claims ... 114 ..." (Final, p.6, lines 5-8). However, the Final also states that "Ito does not explicitly disclose moving a cursor intersecting with a selectable region for selecting the selectable region. However, Baker teaches to use [sic] a cursor control for selecting a selectable region by moving the cursor within the selectable region." (Final, p.3, lines 2-3), and "Ito does not disclose the selection means is responsive to a dwell event. However, Lazzaro discloses to select a selectable region ins response to a dwell events [sic] ..."

(Final, p.3, lines 9-10)

It is left to the Appellant to infer that the Examiner believes that the combination of Ito as modified as modified, Baker, and Lazzaro teach the combination of claim 114. The Appellant here presents argument based on that inference.

5 Ito and Baker are nonanalogous art. They are directed to different problems, flowing from their different operating environments. Ito's system uses a pen stylus. Selection regions outside the display screen are selectable. Baker's system uses a mouse and a conventional mouse adapter (Baker, col. 5, line 65 - col. 6, line 4). Unlike Ito, in Baker there are no external areas outside the display, as will be discussed below. An artisan of ordinary skill would not combine elements from such differing
10 operating environments.

Baker implicitly teaches against the proposed combination for two reasons: (1) Baker's virtual menu items are not normally visible. If they were located outside the display screen, as taught by Ito's Fig. 12, they would never be visible. The user would have no indication when he was in the process of selecting a menu item. Baker, like any reference, implicitly teaches against a modification
15 that would render the system disclosed inoperative; and (2) Baker's purpose of maximizing the available screen area would be frustrated by the proposed combination, as is discussed immediately below.

45. With respect to claim 114, whether Baker teaches **simultaneously** displayed menu options .

20 The object of Baker's invention is to increase the screen real estate available for information display by making menu items, e.g. page up, page down, virtual. "The present invention maximizes the screen area available to the operator for document and data display in the windows both during the functional operations of the display as well as during selection of menu items." (Baker, col. 2, lines 29-32). Baker accomplished this object by **time multiplexing** screen real estate, i.e. using the
25 same space at different times for two different functions: (1) displaying information in a window, and (2) displaying a menu item. Time multiplexing space means that Baker's virtual menu items are invisible during normal operation (Baker, col. 4, line 50-56), but become visible when invoked (Baker, col. 4, line 67).

30 The voice output system of claim 114 "**simultaneously** display[s] a first sequence of one or more characters, a first sequence of one or more words, or a first sequence of one or more symbols representing the first sequence of one or more words". Since the first sequences are simultaneously visible, they do not become visible only when invoked, and their space is not shared with information

in a window. There is no time multiplexing of space either on or off the display screen. Baker's goal of space-saving is frustrated. Thus Baker implicitly teaches against the proposed combination. *In re* Gordon, *supra*.

5 46. With respect to claim 114, whether Baker teaches **selecting** by moving the cursor within a selectable region.

 In the Final, the Examiner's attempts to extract selection by dwell from Baker. "Baker teaches to use a cursor control for **selecting** a selectable region by moving the cursor within the selectable region.... Thus, it would have been obvious to ... modify Ito to move the cursor within the selectable
10 region for **selecting** the selectable region since Baker teaches it is a conventional way to **activate** a selectable region " (Final, p.3, lines 5-11, emphasis added). This is misleading. Baker used the term "activate" to mean display, not select. (Baker, col. 3, lines 1-3). Baker's method of selection has multiple steps:

1. wait for mouse input and convert this input into a first location on the screen (Baker, col. 9,
15 lines 29-32);
2. determine if there is an intersection of the location and one of the areas 1-12 (Baker, col. 9, lines 36-38);
3. if there is an intersection, hide the cursor and display the appropriate virtual menu item;
 (Baker, col. 9, lines 52-55);
- 20 4. wait for mouse input and convert this input into a next location on the screen (Baker, col. 9, lines 60-64);
5. determine if there is an intersection of the next location and area 0, i.e. the normal window (Baker, col. 9, lines 64-69);
- 25 6. if the mouse button has been pressed, implement the function represented by the displayed menu item (Baker, col. 10, lines 1-5).

 Baker discloses **displaying**, not selecting, a virtual menu item responsive to the cursor crossing a peripheral region of the window (Baker, col. 3, lines 1-3; col. 9, lines 52-55). As implemented in Baker's preferred embodiment, the **display** of a virtual menu item is responsive to the intersection of
30 two cursor locations and an external area. "[A] safeguard is built into the system to insure that the operator truly intended to cross into Area=5 and thus **bring up** the MOVE SCREEN menu item. Accordingly, step 86, next mouse input is waited for and converted to the new location." (Baker, col.

9, lines 57-62, emphasis added). Baker discloses **selection** responsive only to a press of the mouse button (Baker, col. 6, line 44, col. 10, lines 1-13, 44, and 65). "[T]he procedure awaits the operator to press the appropriate mouse button so that the function represented by the MOVE SCREEN menu item may now be implemented ..." (Baker, col 10, lines 2-5).

5 The text in Baker does not support the proposition for which it is cited by the Examiner, i.e. moving the cursor within the selectable region for **selecting** the selectable region. Baker, col. 4, lines 15-19, states "The appropriate action may be selected from the menu by activating one of the listed functions in any conventional way, e.g. through a mouse, or keyboard driven cursor or by some sort of touch mechanism such as a light pen or touch screen."

10 In this claim, selection is responsive to a dwell event. Baker does not disclose or suggest selection responsive to a dwell event.

47. With respect to claim 114, whether the Final evidences improper hindsight reconstruction of references.

15 The Examiner has used the instant Specification as a guide for selecting a mosaic of references, deconstructing them, and reassembling extracted features. This is evidenced most clearly by the Examiner's ignoring of significant functional flaws or contrary teachings in the prior art, flaws or teachings which render the prior art inapplicable to various claim limitations. For example, Ito's express direction to move selection regions **from** a display **to** outside the display. In the Final, the Examiner declares this teaching to be "irrelevant" (Final, p.5). By intentionally ignoring Ito's

20 teaching, the Examiner reassembles Ito's invention to render the present claim obvious.

 The Examiner eschews combinations more natural than those proposed but which do not lead to the invention claimed. For example, a more natural combination of Ito and Baker would be to define virtual on-screen menus and display them responsive to selection of one of Ito's selection regions outside the display. Objectively viewed at the time the invention was made, without the

25 benefit of Appellant's Specification, this combination of these references is more in accord with, and does less violence to, the teaching of Ito and Baker than the Examiner's reconstruction.

 "It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court

30 has previously stated that '[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.'" *In re Fritch*, 972 F.2d 1260, 23 USPQ 2d 1780, 1784 (Fed. Cir. 1992) (quoting *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ 2d 1596,

1600 (Fed. Cir. 1987).

48. With respect to the first embodiment of claim 114, the proposed combination teaches circumscribing selectable regions **on** the display screen.

5 In the first embodiment of claim 114, the working region is smaller than the display screen. Since the selectable regions are outside the working region and adjacent the periphery of the working region, they are, at least in part, **on** the display screen.

This issue has already been discussed in connection with claim 20.

10 49. With respect to the first embodiment of claim 114, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

15 50. With respect to the first embodiment of claim 114, whether the proposed combination teaches selectable regions **partially on and partially outside** the display.

This issue has already been discussed in connection with claim 33.

51. With respect to the second embodiment of claim 114, whether Baker teaches a selectable region including a subregion **outside** the display screen.

20 In the Final, the Examiner implies that Baker applies to the first embodiment only. "The claims do not require that the display area or the working is the same size of the display screen, so the window 42 of Baker reads on "a display area" or "a working area" as claimed." (Final, p.8, lines 6-7). Since the Final does not explicitly state whether the Examiner believes Baker to teach the second embodiment, the issue is addressed here.

25 Baker teaches against selectable regions outside the display screen. Baker's invention applies where the menu occupies "a substantial portion of dedicated screen space which might otherwise have been occupied by data windows." (Baker, col. 4, lines 22-24).

30 Baker's external areas are on, not adjacent, the display screen. The Examiner references Baker's Fig. 8, window 42. Although Figures 8 and 9 of Baker do not show the full display screen, Baker clearly indicates that the windows shown in Figures 8 and 9 are **smaller** than the display screen. "FIG. 8 is a diagrammatic representation of a window ... such as that shown in FIG. 3" (Baker, col. 3, lines 53-55). Fig. 9 depicts "window 42 of FIG. 8 and the area surrounding the

periphery 41 of this window" (Baker, col. 7, lines 5-7). Consequently, Baker's external areas are **on**, not outside, the display screen because the exterior box shown in Fig. 8 is smaller than the display screen.

Time multiplexing of space means that Baker's virtual menu items and information must reside in the same space to serve Baker's purpose. If Baker's external areas were located **outside** the display screen, as they are in the second embodiment of the claim 114, they could not be used for information display.

52. With respect to the second embodiment of claim 114, whether the proposed combination of Ito and Lazzaro teaches selection by dwell of a selectable region **outside** the display screen.

Selection according to Lazzaro is by dwell, i.e. intersection with a virtual key from an **on-screen** keyboard for a user-definable time period (Lazzaro, p.62, lines 13-14.) Selecting a region by dwell **requires** coordinate detection. Consequently, in Lazzaro, there is no selection **outside** the on-screen keyboard. Hence, the combination of Ito and Lazzaro does not provide the functionality of the instant claim: selection by dwell of a selectable region **outside** the display screen.

53. With respect to claim 114, whether Ito, as combined with Baker, and Golding are combinable.

Golding is not is the same field as the present invention and does not address a problem in common with Ito and Baker, and therefore is not combinable with these references. Golding addresses the drawback in the data entry art "that the operator has to read the input data document and any reference to the screen or printer requires the operator's visual attention to be shifted from the source document. (Golding, p. 5633, lines 8-10) Golding's disclosure expressly limits speech output to **data/text entry**. (Golding, p.5633, line 1) Furthermore, Golding's speech output represent "spoken commands to the operator" (Golding, p. 5634, lines 20-21), **not** menu options. Thus, Golding does not disclose or suggest **menu options** representing sequences of one or more letters, as claimed.

54. With respect to claim 116, whether the proposed combination teaches **deleting** selection by click.

Ito uses stylus switch closure outside the location detection range of the tablet to signal a cancel command (Ito, Fig. 6; col. 4, lines 51-59; col. 6, lines 3-8), in accord with one of the objects of Ito's invention, increasing the quantity of data on a single screen (Ito, col. 2, lines 6-9 and 38-49). Ito,

if modified to behave as claimed, is inoperable for this function and thus teaches against the proposed modification. In re *Gordon, supra*.

5 55. With respect to claim 117, whether the proposed combination teaches the claimed **predetermined period**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

10 56. With respect to claim 202, whether the proposed combination teaches that the predetermined period is a function of detected **user fatigue**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

15 57. With respect to claim 118, whether the proposed combination teaches **non-adjacent** selectable regions.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

20 58. With respect to claim 119, whether the proposed combination teaches a second selectable region **adjacent the external boundary** of one of the first selectable regions.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

25 59. With respect to claim 120, whether the proposed combination teaches confining the movement related signal on **two** sides of a selectable region.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

30 60. With respect to claim 121, whether the proposed combination teaches confiner **penetrable** under certain conditions.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

61. With respect to claim 122, whether the proposed combination teaches displaying a **second** cursor responsive to the location indicated by the movement related signal.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

62. With respect to claim 123, whether the proposed combination teaches **repeating** the previously spoken first sequence.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

63. With respect to claim 124, whether the proposed combination teaches **repeating** the previously spoken first sequence either more **loudly** or more **slowly**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

64. With respect to claim 126, whether Baker teaches selectable regions **outside** the display screen.

This issue has already been discussed in connection with second embodiment of claim 114.

65. With respect to claim 127, whether Ito teaches a plurality of indicators **on** the display.

The selectable regions are outside the display, as specified in the parent claim. Only the indicators are on the display.

This issue has already been discussed in connection with claim 20 in the issue entitled “whether Ito teaches a circumscribing plurality of selectable regions **on** the display”.

66. With respect to claim 128, whether the proposed combination teaches **intersection indicators**.

The claimed indicator indicate an **intersection** of the movement related signal and the first particular selectable region.

The Final does not address the claimed limitation or combination. Ito does not disclose or suggest one or more indicators for indicating which one of the selectable regions is **intersected** by the first location. Lazzaro states "The user can 'strike' a key in one of two ways. He can focus on the desired key for a user-definable time period (which causes the key to be highlighted), or he can click

on an adapted switch when he chooses the desired key." (Lazzaro, p. 62, lines 13-15). Thus Lazzaro discloses indicating **selection** by highlighting.

67. With respect to claim 129, whether the proposed combination teaches **disabling**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

68. With respect to claim 130, whether the proposed combination teaches **enabling**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

69. With respect to claim 131, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious
This issue has already been discussed in connection with claim 33.

70. With respect to claim 169, whether the proposed combination teaches voice output responsive to a **path** of the user movement.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

71. With respect to claim 200, whether the proposed combination teaches voice output responsive to a **ratio** between durations.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

72. With respect to claim 201, whether the proposed combination teaches a **distance indicator**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

Independent claim 52

Independent claim 52 stands rejected under 35 U.S.C. §103 based upon the combination of Ito and Lazzaro (Final, p.5, lines 12-13).

The issue raised by this claim, whether Ito and Lazzaro are combinable, has already been discussed in the Issues Concerning Many Claims section above.

Independent claim 53

5 Independent claim 53 stands rejected under 35 U.S.C. §103 based upon the combination of Ito as modified and Lazzaro (Final, p.5, lines 12-13).

73. With respect to claim 53, whether the proposed combination teaches selection responsive to the durations of a **plurality of successive periods** of intersection.

10 In the claimed apparatus, the selection means is responsive to "a quantity equalling or exceeding a predetermined quantity, the quantity being a function of the **durations of a plurality of successive periods of intersection** of two or more of the successive locations and one of the selectable regions".

15 The Final does not address the claimed limitation or combination. None of the applied references disclose or suggest such a limitation.

74. With respect to claim 53, whether Ito teaches a circumscribing plurality of selectable regions on the display.

20 The claimed apparatus includes "means for displaying a plurality of selectable regions on a display area ... the plurality of selectable regions together at least partially circumscribing a region on the display area".

This issue has already been discussed in connection with claim 20.

25 75. With respect to claim 53, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

Independent claim 65 and its dependent claims

30 Independent claim 65 stands rejected under 35 U.S.C. §103 based upon the combination of Ito and Lazzaro (Final, p.5, lines 12-13).

76. With respect to claim 65, whether the new result of **accommodating overshoot** is obvious.

This issue has already been discussed in connection with claim 19.

77. With respect to claim 65, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 19.

78. With respect to claim 65, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious.

This issue has already been discussed in connection with claim 19.

79. With respect to claim 65, whether the new results of **accommodating each of tremor and drift** are obvious.

The issue has already been discussed in connection with claim 19.

80. With respect to claim 65, whether the new result of **decreasing error rate** is obvious.

The issue has already been discussed in connection with claim 19.

81. With respect to claim 66, whether Ito teaches selectable regions **adjacent** a confiner.

The selectable regions are adjacent the confiner because the confiner confines the location indicated by the body member to the detector area and each of the selectable regions is adjacent an edge of the detector area.

This issue has already been discussed in connection with claim 19.

Independent claim 67 and its dependent claims

Independent claim 67 stands rejected under 35 U.S.C. §103 based upon the combination of Ito and Anderson (Final, p.6, line 4).

82. With respect to claim 67, whether Anderson teaches a user activatable switch having a **plurality of positions**.

Independent claim 67 is directed to an alternate embodiment of the invention. In this alternate embodiment includes "a user activatable switch ... positionable with respect to the location of **each** of each menu option for selection thereof". Thus, the **one** switch thus has a plurality of positions, each corresponding to the location of one of the menu options. An example of such a user activatable

switch is a multiposition joystick. The relationship is one switch to many menu options.

Anderson, in contrast, discloses a one to one relationship. Anderson teaches a **plurality** of **pushbutton** keys (Anderson, Fig. 2; col. 5, lines 5-9; col. 3, lines 23-26), not multiposition switches. Each key corresponds **respectively** to one of a plurality of menu options. Specifically, each key is associated respectively with a **single** different adjacent horizontal half-line-width region of the screen or with a **single** label (Anderson, col. 4, lines 42-45, col. 20, lines 52-54, and Fig. 8). Each key permits a station set user "to selection a certain portion of the text in a display on the screen" (Anderson, col. 4, lines 46-47, emphasis added).

None of the applied art teaches a user activatable switch positionable with respect to the location of a plurality of menu options.

83. With respect to claim 67, whether the Final provides a motivation to make the proposed combination/modification with Anderson.

In rejecting claim 67, the Examiner has implicitly modified the **plurality** of pushbutton keys disclosed by Anderson into a user activatable switch positionable with respect to the location of each menu option. The Examiner has failed to provide a motivation for this modification.

The Examiner concedes that "Ito as modified does not disclose each menu option associated respectively with a user activatable switch outside the display area" (Final, p.5, lines 1-2). The Examiner find a user activatable switch" in Anderson, but ignores the claim limitation "**the** switch being positionable with respect to the location of **each** menu option for selection thereof". The Examiner's motivation to combine Ito with Anderson is "to enable users to have convenient (**soft key**) access to computer services to exercise specific control over the direction of execution of the program." (Final, p.5, lines 6-8, emphasis added). Assuming *arguendo* that this is sufficient motivation to combine, it is insufficient to support the Examiner's **implicit modification**. The apparatus of claim 67 does not have soft keys and thus does not "enable users to have convenient (soft key) access to computer services".

"Soft keys" (elements 16 and 23 in Anderson's Fig. 2) are another name for pushbutton keys. (Anderson, col. 5, lines 5-9; col. 3, lines 23-26).

84. With respect to claim 67, whether the proposed combination teaches selection responsive to a **period of switch activation**.

The apparatus of claim 67 differs operationally from the combination of Ito and Anderson.

Selection in claim 67 is responsive to "a first position of the switch corresponding to the particular menu option for a period equalling or exceeding a first predetermined time period". Neither Ito nor Anderson, the references relied on by the Examiner to reject this claim, disclose or suggest selection responsive to a **period of switch activation**. Furthermore, Lazzaro does remedy this deficiency.

5 Lazzaro discloses selection by "focus[ing] on the desired key for a user-definable time period" (Lazzaro, p. 62, lines 13-15).

The Final does not address the claimed limitation or combination.

85. With respect to claim 67, whether the new result of **accommodating overshoot** is obvious.

10 The apparatus of independent claim 67 solves a problem not solved by any of the applied art alone or in combination: overshoot. This new result flows from the synergy between the perimeter menu, i.e. the plurality of menu options together at least partially circumscribes a region on the display area, and the user activatable switch having a plurality of positions and being positionable with respect to the location of **each** selectable region.

15 This issue has already been discussed in connection with claim 19.

86. With respect to claim 67, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 19.

20 87. With respect to claim 67, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

88. With respect to claim 67, whether the Examiner's rejection evidences improper hindsight.

25 The Examiner is apparently using the present Specification as a guide through the prior art for reconstructing the claimed invention. This is evident from the Examiner's particular modifications of selected elements of the applied references. For example, Anderson is exclusively directed to selection by soft keys (Anderson, Fig. 2; col. 5, lines 5-9; col. 3, lines 23-26), hard keys (Anderson, col. 5, lines 30-50), steady function keys (Anderson, Fig. 2; col. 4, lines 56-63), and ASCII keyboard
30 keys (Anderson, Fig. 2; col. 5, lines 10-29). Assuming *arguendo* that Anderson can properly be combined with the proposed combination of Ito and selected elements of Lazzaro, the most natural combination would be a device containing pushbutton keys, each corresponding to a menu option.

This combination lacks the functionality of the structure claimed in claim 67. Individuals with impaired motor control cannot operate reliably operate multiple pushbutton keys in the arrangement disclosed by Anderson.

Independent claim 85 and its dependent claims

Independent claim 85 stands rejected under 35 U.S.C. §103 based upon the combination of Ito and Lazzaro (Final, p.5, lines 12-13).

89. With respect to claim 85, whether the combination of Ito and Lazzaro teaches the claimed apparatus.

Neither Ito nor Lazzaro discloses or suggests "selecting a menu option from a **plurality of pluralities** of menu options", or selecting **one of the plurality** of pluralities of menu options, or "selection means ... for associating each of the selectable regions respectively with the menu options of one of the plurality of menu options". Far from supporting **dynamically created associations**, Ito's commands are static, as discussed in connection with the proposed combination of Ito and Atkinson in the Issues Concerning Many Claims section above.

Independent claim 85 combines selection of a **menu**, responsive to a sensor signal, with selection of a menu option from that menu. Neither Ito nor Lazzaro discloses or suggests this **combination**.

90. With respect to claim 85, whether Ito and Baker are combinable.

93. With respect to claim 101, whether the proposed combination teaches a **menu option** representing a sequence of one or more words.

Golding's disclosure expressly limits speech output to **data/text entry**. (Golding, p.5633, line 1) Furthermore, Golding's speech output represent "spoken commands to the operator" (Golding, p. 5634, lines 20-21), **not** menu options. Thus, Golding does not disclose or suggest **menu options** representing sequences of one or more words, as claimed.

94. With respect to claim 101, whether Ito, as combined with Baker, and Golding are combinable.

This issue has already been discussed in connection with claim 114.

95. With respect to claim 102, whether the new result of **accommodating overshoot** is obvious. This issue has already been discussed in connection with claim 33.

96. With respect to claim 102, whether the new result of **increased speed** of selection is obvious. This issue has already been discussed in connection with claim 33.

97. With respect to claim 102, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious. This issue has already been discussed in connection with claim 33.

98. With respect to claim 102, whether the new results of **accommodating each of tremor and drift** are obvious. The issue has already been discussed in connection with claim 33.

99. With respect to claim 102, whether the new result of **decreasing error rate** is obvious. The issue has already been discussed in connection with claim 33.

100. With respect to claim 102, whether the proposed combination teaches selectable regions **partially on and partially outside** the surface. This issue has already been discussed in connection with claim 33.

101. With respect to claim 87, whether the proposed combination teaches a **signal level threshold**.

The Final does not address the claimed limitation or combination. None of the applied art teaches a selection means responsive to a sensor signal equalling or exceeding a predetermined signal level.

102. With respect to claim 88, whether the proposed combination teaches a **signal duration threshold**.

The Final does not address the claimed limitation or combination. None of the applied art teaches a selection means responsive to the sensor signal equalling or exceeding the predetermined signal level for a predetermined period.

103. With respect to claim 105, whether the proposed combination teaches selection means responsive to a **sound**.

The Final does not address the claimed limitation or combination. None of the applied art discloses or suggests an apparatus responsive to a sound.

Independent claim 94

Independent claim 94 stands rejected on the basis of Ito and other, unspecified, art. (Final, p.6, lines 5-8). No art other than Ito is clearly cited against this claim in the Final, as required by 37 C.F.R. §1.113(b).

104. With respect to claim 94, whether the Ito alone teaches the claimed apparatus.

Ito, the sole basis for the rejection of claim 94, does not disclose or suggest "a delimit device completely delimiting an **invisible** selectable region **outside** the display screen", the selectable region "associated with a sequence of one or more words", a voice output device, or "responsive to a quantity equalling or exceeding a predetermined quantity, the quantity being a function of the durations of one or more successive periods of intersection of two or more of the successive locations and the selectable region outside the display screen".

105. With respect to claim 94, whether the proposed combination teaches an **invisible** selectable region outside the display screen.

The claimed invisible selectable region is never visible, i.e. it does not become visible when

invoked, as in Baker (Baker, col. 4, line 67). None of the applied art teaches an invisible selectable region outside the display screen. The Final simply does not address this limitation.

106. With respect to claim 94, whether Baker teaches an invisible selectable regions **outside** the display screen.

The on-screen location of Baker's menu items has already been discussed in connection with the second embodiment of claim 114 and selectable regions outside the display screen.

107. With respect to claim 94, whether the new result of **increased speed** of selection is obvious.

Because the selectable region is outside the display screen, its size is not constrained by the display screen. Thus the selectable region may be very large and the speed of selection consequently increased, in accord with Fitts' Law discussed in the New Results section above and in connection with claims 19 and 33.

108. With respect to claim 94, whether Ito, as combined with Baker, and Golding are combinable.

This issue has already been discussed in connection with claim 114.

Independent claim 106 and its dependent claims

Independent claim 106 stands rejected on the basis of Ito and other, unspecified, art. (Final, p.6, lines 5-8). No art other than Ito is clearly cited against this claim in the Final, as required by 37 C.F.R. §1.113(b).

109. With respect to claim 106, whether the proposed combination teaches selectable regions **partially on and partially outside** the display.

This issue has already been discussed in connection with claim 33.

110. With respect to claim 106, the proposed combination teaches circumscribing selectable regions **on** the display.

This issue has already been discussed in connection with claim 20.

111. With respect to claim 106, whether the new result of **accommodating overshoot** is obvious.

Claim 106 is directed to an apparatus "[i]n a voice output system for a **user having impaired**

motor capability". The apparatus is "for selecting a menu option associated with an **overshot** selectable subregion on a display screen". Each dwell event "includ[es] an intersection of a first one and a second one of the successive locations and one of the subregions **outside** and adjacent the display screen".

5 The issue in the heading has already been discussed in connection with claim 33.

112. With respect to claim 106, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

10 113. With respect to claim 106, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 33.

114. With respect to claim 106, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious.

15 This issue has already been discussed in connection with claim 33.

115. With respect to claim 106, whether the new results of **accommodating each of tremor and drift** are obvious.

20 The issue has already been discussed in connection with claim 33.

116. With respect to claim 106, whether the new result of **decreasing error rate** is obvious.

The issue has already been discussed in connection with claim 33.

25 117. With respect to claim 106, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

Independent claim 134 and its dependent claims

30 Independent claim 134 stands rejected under 35 U.S.C. §103 based upon the combination of Ito, Lazzaro, Choi and Golding (Final, p.5, lines 16-17).

118. With respect to claim 134, whether Choi is **pertinent prior art**.

Choi is not pertinent prior art under 35 U.S.C. §103 because it would not have been known to or consulted by a person having ordinary skill in the art to which the present Application pertains. Choi does not lie within the field of endeavor of the present Application. Choi relates to "a display apparatus for informing a user of a previously programmed recording in which, if it is time to record, a programmed recording mode is displayed on a television (TV) screen in a sub-screen, and more particularly to, a display apparatus for informing a user of a programmed recording in which a relevant message is generated through a PIP (picture in picture) circuit. The message can be generated during both a regeneration mode of a VCR (Video Cassette Recorder) or a TV broadcasting mode." (Choi, col. 1, lines 7-16). A person of ordinary skill in the art of the present Application would have no reason to consult the art of VCR programming.

Choi addresses a problem not even remotely related to the present Application. As stated in Choi, "Generally, when a viewer wants to record a predetermined program of the TV with the VCR, the viewer inputs a recording time, a broadcasting channel and a broadcasting program in advance. Then, when it is the programmed recording time corresponding to the current time, the programmed broadcasting channel is automatically selected and the VCR is subjected to the recording mode, so that the input broadcasting program is automatically recorded. Therefore, at the programmed recording time, the programmed broadcasting program to record is unconditionally recorded even when the viewer is currently watching the TV or watching a regenerated program of the VCR.

"Accordingly, in the case where the viewer does not want to carry out the programmed recording, but wants to continue watching, since the recording mode of the VCR has to be converted to the original mode manually by the viewer, the viewer can not continue his watching without any interruption." (Choi, col. 1, lines 18-36).

The problem addressed by Choi is not reasonably pertinent to the problem addressed by the present Application, and in particular the problem addressed by claim 134: in a voice output device indicating the **difference** between the times of a first and second intersection of a selectable region.

Appellant requested, pursuant to under 37 C.F.R. §1.107(b), that the Examiner provide a prior art reference or affidavit evidencing the required incentive to combine Ito with Choi (Amendment, Applicant Document No. 032-23, filed 28 September 1998). The Examiner has not responded to that request.

119. With respect to claim 134, whether Choi teaches a **dwell time indicator**.

Assuming *arguendo* that Choi is pertinent, combinable prior art, Choi's teaching is very different from the indicator of claim 134. In Choi, the level meter is not responsive to **locations** indicated by a **movement related signal** (the language of claim 134), to any of the "first location **intersecting** the selectable region and, at a later time, a second location **intersecting** the selectable region", or to "the **difference** between the time the second location occurs and the time the first location occurs". In Choi, the level meter is unaffected by the viewer. The viewer cannot increase or decrease the level shown by the level meter. In claim 134, the indicator is responsive, not to a preprogrammed time, but to the difference between the time the second location occurs and the time the first location occurs. Both locations are indicated by the movement related signal. The movement affects the indicator of claim 134. The indicator of claim 134 is interactive; it is affected by movement.

Choi's invention is not directed to menu selection. In Choi, the level meter is not indicative of time to selection, but of time to the beginning of recording. The viewer is free to ignore level meter. Its purpose is just to notify viewer that he can override recording. If the viewer does nothing, recording occurs as previously programmed. In contrast, claim 134 is directed to menu selection. If there is no user interaction, then there is no intersection of a location and a selectable region, and no selection.

The lack of applicability of Choi's level meter to interactive use is best illustrated by an example of selection responsive to a plurality of periods of intersection of the successive locations and the particular selectable region. In the preferred embodiment, dwell time is dynamic -- it accumulates when the successive locations intersect the particular selectable region, and it decays after an initial period of intersection followed by a period of non-intersection. The dwell indication is also dynamic, indicating the fluctuating time remaining to selection. The time remaining to selection, however, fluctuates responsive to the successive locations. In contrast, Choi's level meter is a countdown timer, starting at a fixed time prior to recording start time, and counting down to recording start time. Choi's level meter is not responsive to intersection or non-intersection of locations indicated by a user or a movement related signal.

120. With respect to claim 134, whether the proposed combination teaches the **new result** achieved.

The dwell indicator of claim 134 provides a result not achieved by the proposed combination. Some disabled users, e.g. individuals who drift, can point relatively easily to their intended targets for

short periods of time, but have difficulty pointing for long periods. If such an operator knows that only a little more accurate pointing time is needed he may be able to satisfy the dwell time required for selection, without preparing himself to point accurately for an extended period. In addition, by providing an indication of remaining dwell time, the indicator allows the user to plan his next movement. Indeed, the user may even initiate movement prior to selection of the intersected selectable region if he judges that the time required for him to exit the intersected selectable region is less than the time remaining to selection.

121. With respect to claim 134, whether Ito, as combined with Baker, and Golding are combinable.

This issue has already been discussed in connection with claim 114.

122. With respect to claim 136, whether the proposed combination teaches a **remaining dwell time** indicator.

In the voice output system of claim 136 the indicator indicates the dwell time remaining until the voice output device speaks the sequence of one or more characters and/or words.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

123. With respect to claim 137, whether the proposed combination teaches an indicator for indicating **non-intersection after a dwell indication**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

124. With respect to claim 138, whether the proposed combination teaches an indicator for indicating **the duration of a period of non-intersection after a dwell indication**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

125. With respect to claim 139, whether the proposed combination teaches an indicator for indicating **opposite indications** of the duration of periods of intersection and non-intersection.

The Final does not address the claimed limitation or combination. The limitation is not

disclosed or suggested in any of the applied references.

126. With respect to claim 140, whether the proposed combination teaches a dwell time indication by modification in **brightness**.

5 The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

127. With respect to claim 142, whether the proposed combination teaches a **gradually increasing** dwell time indication and a **marked** indication for selection.

10 The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

128. With respect to claim 143, whether the proposed combination teaches a selection indication by modification in **hue**.

15 The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

129. With respect to claim 144, whether the proposed combination teaches an indicator intersecting the selectable region.

20 The Final does not address the claimed combination.

130. With respect to claim 145, whether the proposed combination teaches an indicator coterminous with the selectable region.

25 The Final does not address the claimed combination.

131. With respect to claim 146, whether the new result of **accommodating overshoot** is obvious. This issue has already been discussed in connection with claim 19.

132. With respect to claim 146, whether Ito teaches selectable regions **adjacent a confiner**.

30 This issue has already been discussed in connection with claim 19.

Independent claim 155 and its dependent claims

Independent claim 155 stands rejected on the basis of Ito and other, unspecified, art. (Final, p.6, lines 5-8). No art other than Ito is clearly cited against this claim in the Final, as required by 37 C.F.R. §1.113(b).

Claim 155, like claim 114, has two embodiments.

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133. With respect to claim 155, whether the proposed combination teaches selection responsive to the durations of a **plurality of successive periods** of intersection.

Selection in claim 155 is "responsive to a quantity equalling or exceeding a predetermined quantity, the quantity being a function of the duration of a **plurality of periods** of intersection".

10 The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

134. With respect to claim 155, whether Ito teaches selectable regions **adjacent a confiner**.

This issue has already been discussed in connection with claim 19.

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135. With respect to claim 155, whether the new result of **accommodating overshoot** is obvious.

This issue has already been discussed in connection with claim 114.

136. With respect to claim 155, whether the new result of **increased speed** of selection is obvious.

20 This issue has already been discussed in connection with claim 114.

137. With respect to claim 155, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious.

This issue has already been discussed in connection with claim 114.

25
138. With respect to claim 155, whether the new results of **accommodating each of tremor and drift** are obvious.

30 A user with tremor or drift may move in and out of the target selectable region. The voice output system of claim 155 is capable of cumulating dwell time. Lazzaro discloses selection responsive to "focus on the desired key for a user-definable time period" (Lazzaro, p.62, lines 13-14.) Therefore, according to Lazzaro, cumulative dwell time is irrelevant.

In the claimed voice output system, selection is responsive to "the duration of a **plurality** of

periods of intersection". This difference allows the claimed voice output system to cumulate dwell time across a plurality of periods of intersection, and so better accomodate tremor and drift.

The issue has already been discussed in connection with claim 114.

5 139. With respect to claim 155, whether the new result of **decreasing error rate** is obvious.

The issue has already been discussed in connection with claim 114.

140. With respect to claim 155, whether the Final evidences improper hindsight reconstruction of references.

10 This issue has already been discussed in connection with claim 114.

141. With respect to the first embodiment of claim 155, the proposed combination teaches circumscribing selectable regions **on** the display screen.

The apparatus of claim 155, like claim 114, covers at least two distinct embodiments,
15 depending upon the size of the working region relative to the display screen.

The issue in the heading has already been discussed in connection with claim 20.

142. With respect to the first embodiment of claim 155, whether the Final provides a motivation to make the proposed modification of Ito.

20 This issue has already been discussed in connection with claim 20.

143. With respect to the first embodiment of claim 155, whether Ito teaches selectable regions **adjacent** a confiner and **on** the display.

This issue has already been discussed in connection with claim 20.

25 144. With respect to the first embodiment of claim 155, whether Ito and Baker are combinable.

This issue has already been discussed in connection with claim 114.

145. With respect to the first embodiment of claim 155, whether Ito teaches selectable regions **on**
30 the display.

This issue has already been discussed in connection with claim 19.

146. With respect to the first embodiment of claim 155, whether the proposed combination teaches selectable regions **partially on and partially outside** the display.

This issue has already been discussed in connection with claim 33.

5 147. With respect to the second embodiment of claim 155, whether Baker teaches **simultaneously** displayed menu options .

This issue has already been discussed in connection with claim 114.

10 148. With respect to the second embodiment of claim 155, whether Baker teaches **selecting** by moving the cursor within a selectable region.

This issue has already been discussed in connection with claim 114.

149. With respect to claim 155, whether Ito, as combined with Baker, and Golding are combinable.

15 This issue has already been discussed in connection with claim 114.

150. With respect to claim 156, whether the proposed combination teaches selection responsive to the **duration of a period of non-intersection**.

20 The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

151. With respect to claim 157, whether the proposed combination teaches intersection and non-intersection having the claimed **opposing effect** on selection.

25 The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

Independent claim 159

Independent claim 159 stands rejected on the basis of the combination of Ito as modified, Golding, Lazzaro and Anderson. (Final, p.5, lines 18-19).

30 152. With respect to claim 159, whether Anderson teaches a user activatable switch having a **plurality of positions**.

This issue has already been discussed in connection with claim 67.

153. With respect to claim 159, whether the Final provides a motivation to make the proposed combination/modification with Anderson.

This issue has already been discussed in connection with claim 67.

154. With respect to claim 159, whether the proposed combination teaches selection responsive to a **period of switch activation**.

This issue has already been discussed in connection with claim 67.

155. With respect to claim 159, whether the new result of **accommodating overshoot** is obvious.

This issue has already been discussed in connection with claim 67.

156. With respect to claim 159, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 19.

157. With respect to claim 159, whether the Examiner's rejection evidences improper hindsight.

This issue has already been discussed in connection with claim 67.

158. With respect to claim 159, whether Ito teaches displayed **menu options on** the display area.

The claimed voice output system includes "a display device for displaying menu options **on** the display area".

This issue has already been discussed in connection with claim 114.

Independent claim 160

Independent claim 160 stands rejected on the basis of the combination of Ito, Golding, Lazzaro and Anderson. (Final, p.5, lines 18-19).

159. With respect to claim 160, whether the proposed combination teaches a **remaining dwell time indicator**.

In the claimed voice output system, the character/word sequence is spoken "in response to the position of the switch corresponding to the particular menu option for a first time period equalling or

exceeding a predetermined time period". The voice output system further includes "an indicator for indicating at least the **difference between the first time period and the predetermined time period**".

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the references cited in the rejection of this claim.

160. With respect to claim 160, whether the proposed combination teaches selection responsive to a **period of switch activation**.

This issue has already been discussed in connection with claim 67.

161. With respect to claim 160, whether the new result of **accommodating overshoot** is obvious.

This issue has already been discussed in connection with claim 67.

162. With respect to claim 160, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 19.

163. With respect to claim 160, whether Anderson teaches a user activatable switch having a **plurality of positions**.

This issue has already been discussed in connection with claim 67.

164. With respect to claim 160, whether the Final provides a motivation to make the proposed combination/modification with Anderson.

This issue has already been discussed in connection with claim 67.

165. With respect to claim 160, whether the Examiner's rejection evidences improper hindsight.

This issue has already been discussed in connection with claim 67.

Independent claim 161

Independent claim 161 stands rejected on the basis of the combination of Ito as modified, Golding, Lazzaro, Atkinson and Anderson. (Final, p.6, lines 1-2).

166. With respect to claim 161, whether Anderson teaches a user activatable switch having a

plurality of positions.

This issue has already been discussed in connection with claim 67.

- 5 167. With respect to claim 161, whether the Final provides a motivation to make the proposed combination/modification with Anderson.

This issue has already been discussed in connection with claim 67.

- 10 168. With respect to claim 161, whether the proposed combination teaches selection responsive to a **period of switch activation**.

This issue has already been discussed in connection with claim 67.

169. With respect to claim 161, whether the new result of **accomodating overshoot** is obvious.

This issue has already been discussed in connection with claim 67.

- 15 170. With respect to claim 160, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 19.

171. With respect to claim 161, whether the Examiner's rejection evidences improper hindsight.

20 This issue has already been discussed in connection with claim 67 with respect to the combination of Ito, Golding, Lazzaro, and Anderson. The combinability of Ito and Atkinson has already been discussed in the Issues Concerning Many Claims section above.

172. With respect to claim 161, whether Ito teaches displayed **menu options on** the display area.

This issue has already been discussed in connection with claim 114.

Independent claim 162

Independent claim 162 stands rejected on the basis of the combination of Ito as modified, Golding, Lazzaro and Anderson. (Final, p.5, lines 18-19).

- 30 173. With respect to claim 162, whether the proposed combination teaches selection responsive to a **plurality of periods** of switch activation.

In the claimed voice output system, the particular character/word sequence is spoken "in

response a quantity equalling or exceeding a predetermined quantity, the quantity being a function of the duration of a **plurality of periods** in which the position of the switch corresponds to the particular menu option". The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

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174. With respect to claim 162, whether Anderson teaches a user activatable switch having a **plurality of positions**.

This issue has already been discussed in connection with claim 67.

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175. With respect to claim 162, whether the Final provides a motivation to make the proposed combination/modification with Anderson.

This issue has already been discussed in connection with claim 67.

176. With respect to claim 162, whether the new result of **accomodating overshoot** is obvious.

15
This issue has already been discussed in connection with claim 67.

177. With respect to claim 106, whether the new results of **accomodating each of tremor and drift** are obvious.

The issue has already been discussed in connection with claim 155.

20
178. With respect to claim 162, whether the Examiner's rejection evidences improper hindsight.

This issue has already been discussed in connection with claim 67.

179. With respect to claim 162, whether Ito teaches displayed **menu options on** the display area.

25
This issue has already been discussed in connection with claim 114.

Independent claim 78

Independent claim 78 stands rejected on the basis of Ito and other, unspecified, art. (Final, p.6, lines 5-8). No art other than Ito is clearly cited against this claim in the Final, as required by 37
30 C.F.R. §1.113(b).

180. With respect to claim 78, whether the proposed combination teaches an **invisible** selectable

subregion outside the display area.

This issue has already been discussed in connection with claim 94.

- 5 181. With respect to claim 78, the proposed combination teaches circumscribing selectable regions
on the display.

This issue has already been discussed in connection with claim 20.

182. With respect to claim 78, whether the Final provides a motivation to make the proposed
modification of Ito.

10 This issue has already been discussed in connection with claim 20.

183. With respect to claim 78, whether the proposed combination teaches selectable regions
partially on and partially outside the display.

This issue has already been discussed in connection with claim 33.

- 15 184. With respect to claim 78, whether the new result of **accomodating overshoot** is obvious.

This issue has already been discussed in connection with claim 33.

185. With respect to claim 78, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 33.

- 20 186. With respect to claim 78, whether the new result of **simultaneously** accommodating impaired
fine motor control and providing space for an application program window is obvious.

This issue has already been discussed in connection with claim 33.

- 25 187. With respect to claim 78, whether the new results of **accomodating each of tremor and drift**
are obvious.

The issue has already been discussed in connection with claim 33.

188. With respect to claim 78, whether the new result of **decreasing error rate** is obvious.

30 The issue has already been discussed in connection with claim 33.

Independent claim 79

Independent claim 79 stands rejected on the basis of the combination of Ito as modified and Lazzaro. (Final, p.5, lines 12-13).

189. With respect to claim 79, whether Ito teaches selectable regions **adjacent a confiner**.

This issue has already been discussed in connection with claim 19.

190. With respect to claim 79, the proposed combination teaches circumscribing selectable regions **on** the display.

This issue has already been discussed in connection with claim 20.

191. With respect to claim 79, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

192. With respect to claim 79, whether Ito teaches selectable regions **adjacent** a confiner and **on** the display.

This issue has already been discussed in connection with claim 20.

193. With respect to claim 65, whether the new result of **accomodating overshoot** is obvious.

This issue has already been discussed in connection with claim 19.

194. With respect to claim 65, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 19.

195. With respect to claim 65, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious.

This issue has already been discussed in connection with claim 19.

196. With respect to claim 65, whether the new results of **accomodating each of tremor and drift** are obvious.

The issue has already been discussed in connection with claim 19.

197. With respect to claim 65, whether the new result of **decreasing error rate** is obvious.
The issue has already been discussed in connection with claim 19.

Independent claim 80

5 Independent claim 80 stands rejected on the basis of the combination of Ito as modified, Baker, Golding, and Lazzaro. (Final, p.5, lines 10-11).

198. With respect to claim 80, whether Ito teaches selectable regions **adjacent a confiner**.

10 One step of the claimed method includes "displaying a plurality of selectable regions within a polygon on the display, each selectable region **adjacent** a side of the polygon". Another step is "receiving a movement related signal and moving at least part of a cursor **only** within the polygon responsive to the movement related signal". Thus the cursor is confined to polygon which includes a perimenter menu.

This issue has already been discussed in connection with claim 19.

15 199. With respect to claim 80, the proposed combination teaches circumscribing selectable regions **on** the display.

This issue has already been discussed in connection with claim 20.

20 200. With respect to claim 80, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

25 201. With respect to claim 80, whether Ito teaches selectable regions **adjacent a confiner and on** the display.

This issue has already been discussed in connection with claim 20.

202. With respect to claim 80, whether the new result of **accomodating overshoot** is obvious.

This issue has already been discussed in connection with claim 19.

30 203. With respect to claim 80, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 19.

204. With respect to claim 80, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious.

This issue has already been discussed in connection with claim 19.

205. With respect to claim 80, whether the new results of **acomodating each of tremor and drift** are obvious.

The issue has already been discussed in connection with claim 19.

206. With respect to claim 80, whether the new result of **decreasing error rate** is obvious.

The issue has already been discussed in connection with claim 19.

207. With respect to claim 80, whether Ito and Baker are combinable.

This issue has already been discussed in connection with claim 114.

208. With respect to claim 80, whether the Final evidences improper hindsight reconstruction of references.

This issue has already been discussed in connection with claim 114.

209. With respect to claim 80, whether Ito, as combined with Baker, and Golding are combinable.

This issue has already been discussed in connection with claim 114.

Independent claim 163

Independent claim 163 stands rejected on the basis of the combination of Ito, Baker, Golding, and Lazzaro. (Final, p.5, lines 10-11).

210. With respect to claim 163, whether the new result of **acomodating overshoot** is obvious.

The speaking step of the claimed method is "responsive to a period of intersection of the particular selectable region and the location indicated by the movement related signal **or the location on the display closest thereto**". Accomodating overshoot is explicitly claimed: "whereby the user may make a selection although the user movement overshoots the particular selectable region on the display".

This issue has already been discussed in connection with claim 19.

211. With respect to claim 163, whether the new result of **increased speed** of selection is obvious.
This issue has already been discussed in connection with claim 19.

212. With respect to claim 163, whether the new result of **simultaneously** accommodating impaired
fine motor control and providing space for an application program window is obvious.
This issue has already been discussed in connection with claim 19.

213. With respect to claim 163, whether the new results of **accomodating each of tremor and drift**
are obvious.
The issue has already been discussed in connection with claim 19.

214. With respect to claim 163, whether the new result of **decreasing error rate** is obvious.
The issue has already been discussed in connection with claim 19.

215. With respect to claim 163, whether Ito and Baker are combinable.
This issue has already been discussed in connection with claim 114.

216. With respect to claim 163, whether the Final evidences improper hindsight reconstruction of
references.
This issue has already been discussed in connection with claim 114.

217. With respect to claim 163, whether Ito, as combined with Baker, and Golding are combinable.

This issue has already been discussed in connection with claim 114.

Independent claim 170 and its dependent claims

Independent claim 170 stands rejected on the basis of Ito and other, unspecified, art. (Final,
p.6, lines 5-8). No art other than Ito is clearly cited against this claim in the Final, as required by 37
C.F.R. §1.113(b).

218. With respect to claim 170, whether the proposed combination of Ito and Lazzaro teaches
selection by dwell of a selectable region **outside** the display screen.

This issue has already been discussed in connection with claim 114.

219. With respect to claim 172, whether the proposed combination teaches selection responsive to the durations of a **plurality of successive periods** of intersection.

This issue has already been discussed in connection with claim 53.

220. With respect to claim 173, whether the proposed combination teaches a partially **invisible** selectable region outside the display screen.

This issue has already been discussed in connection with claim 94.

221. With respect to claim 174, whether the proposed combination teaches at most one of the selectable regions is adjacent the display screen.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

222. With respect to claim 177, whether the proposed combination teaches selection responsive to a **ratio** between durations.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

223. With respect to claim 178, whether Ito teaches a plurality of selectable regions **on** the display.

This issue has already been discussed in connection with claim 20.

224. With respect to claim 178, whether the proposed combination teaches selectable regions **partially on and partially outside** the display.

This issue has already been discussed in connection with claim 33.

225. With respect to claim 179, whether the new result of **acomodating overshoot** is obvious.

The claimed structure accomodates overshoot of those selectable regions on the display screen adjacent their associated selectable region outside the display screen.

This issue has already been discussed in connection with claim 33.

226. With respect to claim 179, whether the new result of **increased speed** of selection is obvious.
This issue has already been discussed in connection with claim 33.

227. With respect to claim 179, whether the new result of **simultaneously** accommodating impaired
fine motor control and providing space for an application program window is obvious.
This issue has already been discussed in connection with claim 33.

228. With respect to claim 179, whether the new results of **accomodating each of tremor and drift**
are obvious.
The issue has already been discussed in connection with claim 33.

229. With respect to claim 179, whether the new result of **decreasing error rate** is obvious.
The issue has already been discussed in connection with claim 33.

230. With respect to claim 180, whether the proposed combination teaches selectable regions **on** the
display.
This issue has already been discussed in connection with claim 20.

231. With respect to claim 180, whether the Final provides a motivation to make the proposed
modification of Ito.
This issue has already been discussed in connection with claim 20.

232. With respect to claim 181, whether the proposed combination teaches **circumscribing**
selectable regions **on** the display.
This issue has already been discussed in connection with claim 20.

233. With respect to claim 182, whether Choi is **pertinent prior art**.
This issue has already been discussed in connection with claim 134.

234. With respect to claim 182, whether Choi teaches a **dwell time indicator**.
This issue has already been discussed in connection with claim 134.

235. With respect to claim 182, whether the proposed combination teaches a **remaining dwell time** indicator.

This issue has already been discussed in connection with claim 136.

5 236. With respect to claim 183, whether the proposed combination teaches a **tactile indicator**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

10 237. With respect to claim 184, whether the proposed combination teaches indicating on the screen the **location** of one of the successive locations located **outside** the screen.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

15 238. With respect to claim 185, whether the proposed combination teaches **indicating the distance** to one of the successive locations located outside the display screen.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

20 239. With respect to claim 186, whether the proposed combination teaches selection responsive to detected **user fatigue**.

This issue has already been discussed in connection with claim 202.

25 240. With respect to claim 187, whether the proposed combination teaches a **remaining dwell time** indicator.

This issue has already been discussed in connection with claim 136.

30 241. With respect to claim 188, whether the proposed combination teaches selectable regions **partially on and partially outside** the display.

This issue has already been discussed in connection with claim 33.

242. With respect to claim 189, whether the proposed combination teaches **dynamic** menus on the display.

This issue has already been discussed in connection with claim 33.

243. With respect to claim 190, whether the proposed combination teaches an **invisible** selectable region outside the display screen.

This issue has already been discussed in connection with claim 94.

244. With respect to claim 191, whether Atkinson teaches a menu and its submenu associated with the **same selectable regions**.

According to claim 191, each of the selectable regions is associated respectively with **both** a menu option and a submenu option. This has the advantage of conserving space, but forfeits simultaneous accessibility. Atkinson's teaching is 180 degrees opposite. Atkinson teaches against conserving space by overlapping the pull-down menu and the menu bar. "Overlapping of the menu bar should be prevented because the detached menu window will obscure command options on the menu bar if overlapping occurs." (Atkinson, col. 6, lines 52-55). Atkinson's invention is directed at keeping the pull-down menu "constantly accessible" (Atkinson, col. 5, line 40).

None of the applied references disclose or suggest selectable regions is associated respectively with **both** a menu option and a submenu option

245. With respect to claim 191, whether Atkinson can be modified so its menus and submenu are associated with the same selectable regions.

Modifying Atkinson so its menus and submenu are associated with the same selectable regions renders Atkinson inoperable for its intended purpose. Therefore Atkinson effectively teaches away from the claimed invention and does not establish *prima facie* obviousness. *In re Gordon, supra*.

246. With respect to claim 192, whether Ito, as combined with Baker, and Golding are combinable.

This issue has already been discussed in connection with claim 114.

247. With respect to claim 193, whether the proposed combination teaches an **invisible** selectable region outside the display screen.

This issue has already been discussed in connection with claim 94.

248. With respect to claim 195, whether the proposed combination teaches selectable regions **partially on and partially outside** the display.

This issue has already been discussed in connection with claim 33.

249. With respect to claim 196, whether whether the proposed combination teaches the claimed device controller.

Ito, the only art cited against this claim, does not disclose or suggest a device controller. Ito discloses a data entry application (Ito, Fig. 9) and the commands cancel, next page, previous page, and reset (Ito, Fig. 6, 13).

Independent claim 1 and its dependent claims

Independent claim 1 stands rejected on the basis of Ito and other, unspecified, art. (Final, p.6, lines 5-8). No art other than Ito is clearly cited against this claim in the Final, as required by 37 C.F.R. §1.113(b).

The issues raised by claim 1 are identical to those raised by claim 170.

250. With respect to claim 204, whether the proposed combination teaches a movement related signal receiving means that is **not flush against the display screen**.

Ito's invention, objects and disclosure relate **solely** to an **integrated** display/input device, as described in connection with the issue entitled "Whether Ito and Lazzaro are combinable" in the Issues Concerning Many Claims section above.

251. With respect to claim 205, whether the proposed combination teaches a selectable region having a size of **at least 5% of the user's range of motion**.

The maximum dimensions of the selection regions disclosed by Ito, e.g. Ito's Fig. 5, or by any of the applied art (Baker, Fig. 3; Lazzaro, p.62), are, by any estimation, substantially less than 5% of the user's range of motion. The magnitude of the size of the selectable regions of claim 205 leads to an important functional difference. They are substantially faster to select than any of the applied art selection regions, in accord with Fitts' Law, described in the New Results section above.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

Independent claim 54 and its dependent claims

Independent claim 54 stands rejected on the basis of the combination of Ito as modified and Lazzaro. (Final, p.5, lines 12-13).

5 252. With respect to claim 54, whether the proposed combination teaches selection responsive to **only** an intersection of a cursor and a selectable region.

In claim 54, the selection means is responsive "**only** to an intersection of the cursor and a first one of the first plurality of regions and thereafter to a first selection event". None of the applied art discloses or suggests **selection** responsive **only** to an intersection.

10 Claim 54 was rejected based on a combination of Ito and Lazzaro. Ito discloses selection by click only. (Fig. 7; col. 3, lines 51-54; col. 4, line 62-col. 5, line 5). Lazzaro discloses selection by dwell or click, stating "The user can 'strike' a key in one of two ways. He can focus on the desired key for a user-definable time period (which causes the key to be highlighted), or he can click on an adapted switch when he chooses the desired key." (Lazzaro, p.62, lines 13-15). Neither of these
15 references disclose or suggest the selection means of claim 54.

253. With respect to claim 54, whether Atkinson teaches selection responsive to **only** an intersection of a cursor and a selectable region.

20 Atkinson requires **more** than an intersection of a cursor and a selectable region. To select a command option (Atkinson, Fig. 4A, step 102) requires an intersection of the cursor and a command option (Atkinson Col. 5, lines 9-15) **and** "setting the switch means to a second position ('S=2') (or by manipulating other signal generation means to signal selection of a command option)." (Atkinson col. 5, lines 54-57). To remove the menu window from the menu bar requires that "the user keeps the the switch means 90 set at the second position **while** moving the cursor control means 20 such that the
25 cursor 6 is moved from within the menu window to cross the border 16 of the menu window 1." (Atkinson col. 6, lines 29-33, emphasis added).

254. With respect to claim 54, whether Baker teaches **selecting** by moving the cursor within a selectable region.

30 This issue has already been discussed in connection with claim 114.

255. With respect to claim 54, the proposed combination teaches circumscribing regions **on** the

display.

This issue has already been discussed in connection with claim 19.

- 5 256. With respect to claim 55, whether the proposed combination teaches **displaying**
circumscribing regions responsive to a switch operation.

None of the applied art discloses or suggests **displaying circumscribing regions** responsive to a switch operation signal.

The Final does not address this limitation or combination.

- 10 257. With respect to claim 56, whether the proposed combination teaches **displaying** selectable
regions responsive to a switch operation signal.

None of the applied art discloses or suggests **displaying** selectable regions responsive to a switch operation signal.

The Final does not address this limitation or combination.

15 Independent claim 147 and its dependent claims

Independent claim 147 stands rejected on the basis of Ito and other, unspecified, art. (Final, p.6, lines 5-8). No art other than Ito is clearly cited against this claim in the Final, as required by 37 C.F.R. §1.113(b).

20 Claim 147, like claim 114, has two embodiments.

258. With respect to claim 147, whether Ito teaches selectable regions **adjacent a confiner**.

This issue has already been discussed in connection with claim 19.

- 25 259. With respect to claim 147, whether the new result of **accommodating overshoot** is obvious.

The claim explicitly incorporates the new result: "thereby providing the user with the ability to select each of the specific and the particular selectable regions while overshooting the specific or the particular selectable region or by providing a confiner to the specific or the particular selectable region for the movement related signal".

30 This issue has already been discussed in connection with claim 114

260. With respect to claim 147, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 114.

261. With respect to claim 147, whether the Final evidences improper hindsight reconstruction of references.

5 This issue has already been discussed in connection with claim 114.

262. With respect to the first embodiment of claim 147, the proposed combination teaches circumscribing selectable regions **on** the display area.

10 The apparatus of claim 147, like claim 114, covers at least two distinct embodiments, depending upon the size of the working region relative to the display area.

The issue in the heading has already been discussed in connection with claim 20.

263. With respect to the first embodiment of claim 147, whether the Final provides a motivation to make the proposed modification of Ito.

15 This issue has already been discussed in connection with claim 20.

264. With respect to the first embodiment of claim 147, whether Ito teaches selectable regions **adjacent** a confiner and **on** the display.

20 This issue has already been discussed in connection with claim 20.

265. With respect to the first embodiment of claim 147, whether Ito and Baker are combinable.

This issue has already been discussed in connection with claim 114.

266. With respect to the first embodiment of claim 147, whether Ito teaches selectable regions **on** the display.

25 This issue has already been discussed in connection with claim 19.

267. With respect to the first embodiment of claim 147, whether the proposed combination teaches selectable regions **partially on and partially outside** the display.

30 This issue has already been discussed in connection with claim 33.

268. With respect to the second embodiment of claim 147, whether Ito teaches simultaneously

displayed **menu options on** the display area.

This issue has already been discussed in connection with claim 114.

269. With respect to the second embodiment of claim 147, whether Baker teaches **simultaneously**
displayed menu options on the display area.

This issue has already been discussed in connection with claim 114.

270. With respect to claim 147, whether Ito, as combined with Baker, and Golding are combinable.

This issue has already been discussed in connection with claim 114.

271. With respect to claim 148, whether the proposed combination teaches the claimed **relationship**
between a menu option and a submenu option.

The Final does not address the claimed limitation or combination. The limitation is not
disclosed or suggested in any of the applied references.

272. With respect to claim 149, whether the proposed combination teaches any of the enumerated
classes.

This issue has already been discussed in connection with claim 32.

273. With respect to claim 150, whether the proposed combination teaches **distributing menu**
options.

In claim 150, the submenu options are dynamically displayed, i.e. displayed responsive to the
selection of the specific selectable region. This issue has already been discussed in connection with
the combination of Ito and Atkinson in the Issues Concerning Many Claims section above.

274. With respect to claim 151, whether the proposed combination teaches distributing perimeter
submenu options responsive to **frequency of use.**

This issue has already been discussed in connection with claim 36.

275. With respect to claim 152, whether the proposed combination teaches the claimed **relationship**
between screen distance and frequency of use.

This issue has already been discussed in connection with claim 37.

276. With respect to claim 153, whether the proposed combination teaches the claimed **relationship between the position of a character and the position of a submenu option**.

This issue has already been discussed in connection with claim 38.

277. With respect to claim 154, whether the proposed combination teaches any of the enumerated **symbols**.

None of the enumerated symbols are disclosed or suggested in any of the applied references.

This issue has already been discussed in connection with claim 32.

278. With respect to claim 167, whether the proposed combination teaches hierarchical perimeter menus including **overlapping** selectable regions.

This issue has already been discussed in connection with claim 191 and in connection with the combination of Ito and Atkinson in the Issues Concerning Many Claims section above.

279. With respect to claim 168, whether the proposed combination teaches hierarchical perimeter menus including a **plurality of overlapping** selectable regions.

This issue has already been discussed in connection with claim 191 and in connection with the combination of Ito and Atkinson in the Issues Concerning Many Claims section above.

280. With respect to claim 203, whether the proposed combination teaches any of the enumerated classes of characters or words.

None of the enumerated classes are disclosed or suggested in any of the applied references.

This issue has already been discussed in connection with claim 32.

Independent claim 158

Independent claim 158 stands rejected on the basis of Ito and other, unspecified, art. (Final, p.6, lines 5-8). No art other than Ito is clearly cited against this claim in the Final, as required by 37 C.F.R. §1.113(b).

Claim 158, like claim 114, has two embodiments.

281. With respect to claim 158, whether Ito teaches selectable regions **adjacent a confiner**.

This issue has already been discussed in connection with claim 19.

282. With respect to claim 158, whether the new result of **accomodating overshoot** is obvious.

The claim explicitly incorporates the new result of accomodating overshoot: "thereby providing the user with the ability to select the particular selectable region while overshooting the particular selectable region with the movement related signal or by providing a confiner to the particular selectable region for the movement related signal".

This issue has already been discussed in connection with claim 114.

283. With respect to claim 158, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 114.

284. With respect to claim 158, whether Baker teaches **selecting** by moving the cursor within a selectable region.

This issue has already been discussed in connection with claim 114.

285. With respect to claim 158, whether Ito and Baker are combinable.

This issue has already been discussed in connection with claim 114.

286. With respect to claim 158, whether the Final evidences improper hindsight reconstruction of references.

This issue has already been discussed in connection with claim 114.

287. With respect to the first embodiment of claim 158, the proposed combination teaches circumscribing selectable regions **on** the display screen.

This issue has already been discussed in connection with claim 20.

288. With respect to the first embodiment of claim 158, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

289. With respect to the first embodiment of claim 158, whether Ito teaches selectable regions **adjacent** a confiner and **on** the display.

This issue has already been discussed in connection with claim 20.

5 290. With respect to the first embodiment of claim 158, whether the proposed combination teaches selectable regions **partially on and partially outside** the display.

This issue has already been discussed in connection with claim 33.

10 291. With respect to the second embodiment of claim 158, whether Baker teaches a selectable region including a subregion **outside** the display screen.

This issue has already been discussed in connection with claim 114.

Independent claim 165

15 Independent claim 165 stands rejected on the basis of Ito and other, unspecified, art. (Final, p.6, lines 5-8). No art other than Ito is clearly cited against this claim in the Final, as required by 37 C.F.R. §1.113(b).

Claim 165, like claim 114, has two embodiments.

292. With respect to claim 165, whether Ito teaches selectable regions **adjacent a confiner**.

This issue has already been discussed in connection with claim 19.

20 293. With respect to claim 165, whether the new result of **accomodating overshoot** is obvious.

Claim 165 explicitly claims the new result of accomodating overshoot: "thereby providing the user with the ability to select the first particular selectable region while overshooting the first particular selectable region or by preventing the movement related signal from moving beyond the external boundary of the first particular selectable region".

This issue has already been discussed in connection with claim 114.

294. With respect to claim 165, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 114.

30 295. With respect to claim 165, whether Baker teaches **simultaneously** displayed menu options .

This issue has already been discussed in connection with claim 114.

296. With respect to claim 165, whether Ito and Baker are combinable.

This issue has already been discussed in connection with claim 114.

297. With respect to claim 165, whether the Final evidences improper hindsight reconstruction of references.

This issue has already been discussed in connection with claim 114.

298. With respect to claim 165, whether Baker teaches **selecting** by moving the cursor within a selectable region.

This issue has already been discussed in connection with claim 114.

299. With respect to the first embodiment of claim 165, the proposed combination teaches circumscribing selectable regions **on** the display screen.

This issue has already been discussed in connection with claim 20.

300. With respect to the first embodiment of claim 165, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

301. With respect to the first embodiment of claim 165, whether Ito teaches selectable regions **adjacent** a confiner and **on** the display.

This issue has already been discussed in connection with claim 20.

302. With respect to the first embodiment of claim 165, whether the proposed combination teaches selectable regions **partially on and partially outside** the display.

This issue has already been discussed in connection with claim 33.

303. With respect to the second embodiment of claim 165, whether Baker teaches a selectable region including a subregion **outside** the display screen.

This issue has already been discussed in connection with claim 114.

304. With respect to claim 165, whether Ito, as combined with Baker, and Golding are combinable.

This issue has already been discussed in connection with claim 114.

Independent claim 198

5 Independent claim 198 stands rejected on the basis of the combination of Ito as modified, Baker, and Golding. (Final, p.6, line 3).

305. With respect to claim 198, whether Ito teaches selectable regions **on** the display.

10 In the apparatus of claim 198, the "display screen includ[es]" a working region with a periphery, the display screen [is] capable of displaying a plurality of selectable regions adjacent the periphery of the working region, ... each of the selectable regions [is] associated respectively with and **simultaneously display[s] on the display screen one of the sequences of one or more words or symbols**".

This issue has already been discussed in connection with claim 20.

15 306. With respect to claim 198, whether Baker teaches **simultaneously** displayed menu options .

This issue has already been discussed in connection with claim 155.

307. With respect to claim 198, whether Ito, as combined with Baker, and Golding are combinable.

20 This issue has already been discussed in connection with claim 114.

Independent claim 39 and its dependent claims

25 Independent claim 39 stands rejected on the basis of Ito and other, unspecified, art. (Final, p.6, lines 5-8). No art other than Ito is clearly cited against this claim in the Final, as required by 37 C.F.R. §1.113(b).

308. With respect to claim 39, whether the Ito, Lazzaro, or Baker teaches **indicators for indicating intersection of selectable regions outside the display area**.

30 37 C.F.R. §1.113(b) requires that the Examiner **clearly** state the reasons supporting the rejection. The Examiner has failed to do so with respect to claim 39.

The claimed apparatus includes "means for at least partially delimiting a plurality of selectable

regions, each of the selectable regions **outside** the display area", and "a plurality of indicators, each associated respectively with one of the selectable regions, **for indicating which one of the selectable regions is intersected by the location**".

5 It is left to the Appellant to infer that the Examiner believes that some combination of the applied references teach indicators for indicating intersection of selectable regions outside the display area.

10 The Final does not address the claimed limitation or combination. Ito does not disclose or suggest one or more indicators for indicating which one of the selectable regions is **intersected** by the first location. Lazzaro states "The user can 'strike' a key in one of two ways. He can focus on the desired key for a user-definable time period (which causes the key to be **highlighted**), or he can click on an adapted switch when he chooses the desired key." (Lazzaro, p. 62, lines 13-15, emphasis added). Thus Lazzaro discloses indicating **selection** by highlighting. Baker's virtual menu items are themselves selectable; they are not separate from Baker's selection regions. Baker's virtual menu items are not normally visible. If they were located outside the display area, like the selectable
15 regions of claim 39, they would never be visible. The user would have no indication when he was in the process of selecting a menu item. Baker, like any reference, implicitly teaches against a modification that would render the system disclosed inoperative.

20 309. With respect to claim 39, whether Ito and Baker are combinable.

This issue has already been discussed in connection with claim 114.

310. With respect to claim 39, whether the Final evidences improper hindsight reconstruction of references.

This issue has already been discussed in connection with claim 114.

25 311. With respect to claim 44, whether Ito teaches **on-display menu options indicating the location of off-display selectable regions**.

30 In claim 44, "the location indication means further comprises means for displaying each menu option on the display area, wherein the location of each displayed menu option indicates the location of the associated selectable region".

In Ito's Fig. 2, **both** the command items and the selection regions are **within** the LCD's display range. In Ito's Fig. 12, **both** the command items and the regions of the coordinate detection area are

outside the LCD's display range. The modification needed to transform Fig. 12 into the apparatus of claim 44 is adding on-display selectable regions. Ito's teaching against such a modification, as was discussed in connection with claim 19.

5 312. With respect to claim 44, whether Baker teaches **on-display menu options indicating the location of off-display selectable regions**.

The issue has already been discussed in connection with claim 114 under the issue entitled "whether Baker teaches a selectable region including a subregion **outside** the display screen."

10 313. With respect to claim 47, whether the proposed combination teaches **disabling**.

The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

314. With respect to claim 48, whether the proposed combination teaches **enabling**.

15 The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

315. With respect to claim 49, whether the proposed combination teaches **partially delimited** selectable regions.

20 The Final does not address the claimed limitation or combination. The limitation is not disclosed or suggested in any of the applied references.

Independent claim 61 and its dependent claims

25 Independent claim 61 stands rejected on the basis of Ito and other, unspecified, art. (Final, p.6, lines 5-8). No art other than Ito is clearly cited against this claim in the Final, as required by 37 C.F.R. §1.113(b).

316. With respect to claim 61, whether the proposed combination teaches a **clipper**.

30 The claimed menu option selector includes "a clipper for generating, in response to the location indicated by the body member of the operator **indicating a location outside the display area**, a clipped location indicative of a location on the display area".

The Final does not address the claimed limitation or combination. None of the applied

references disclose or suggest such a clipper.

317. With respect to claim 61, whether the proposed combination teaches **selection responsive to a clipped location**.

5 The Final does not address the claimed limitation or combination. None of the applied references disclose or suggest selection responsive to an the intersection of a clipped location and a selectable region on a display area.

10 318. With respect to claim 61, the proposed combination teaches circumscribing selectable regions **on the display**.

This issue has already been discussed in connection with claim 20.

319. With respect to claim 61, whether the Final provides a motivation to make the proposed modification of Ito.

15 This issue has already been discussed in connection with claim 20.

320. With respect to claim 62, whether the new result of **accommodating overshoot** is obvious.

20 The menu option selector of claim 62 accommodates overshoot. In claim 62, the selectable regions are adjacent an edge of the display area. The clipper generates a clipped indicative of a location on the display area.

The issue has already been discussed in connection with claim 19.

Independent claim 63 and its dependent claims

25 Independent claim 63 stands rejected on the basis of the combination of Ito as modified, and Lazzaro. (Final, p.5, lines 12-13).

321. With respect to claim 63, the proposed combination teaches circumscribing selectable regions **on the display**.

This issue has already been discussed in connection with claim 20.

30 322. With respect to claim 63, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

323. With respect to claim 63, whether Ito and Lazzaro are combinable.

This issue has already been discussed in the section entitled "Issues Concerning Many Claims."

Independent claim 71

Independent claim 71 stands rejected on the basis of Ito as modified. (Final, p.5, line 9).

324. With respect to claim 71, the proposed combination teaches circumscribing selectable regions **on the display**.

This issue has already been discussed in connection with claim 20.

325. With respect to claim 71, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

326. With respect to claim 71, whether Ito teaches selectable regions **adjacent** a confiner.

In claim 71, the program means is for: "displaying a plurality of selectable regions **within** a polygon on the display, each selectable region **adjacent** a side of the polygon, the plurality of selectable regions together at least partially circumscribing a region on the display".

The structural difference and functional advantage over the applied art of moving the cursor "**within** the polygon" on the display has already been discussed under the above heading in connection with claim 19.

327. With respect to claim 71, whether Ito teaches selectable regions **adjacent** a confiner and **on the display**.

This issue has already been discussed in connection with claim 20.

328. With respect to claim 71, whether the new result of **accommodating overshoot** is obvious.

This issue has already been discussed in connection with claim 19.

329. With respect to claim 71, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 19.

330. With respect to claim 71, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious.
This issue has already been discussed in connection with claim 19.

5 331. With respect to claim 71, whether the new results of **accommodating each of tremor and drift** are obvious.
The issue has already been discussed in connection with claim 19.

10 332. With respect to claim 71, whether the new result of **decreasing error rate** is obvious.
The issue has already been discussed in connection with claim 19.

Independent claim 72

Independent claim 65 stands rejected under 35 U.S.C. §103 based upon the combination of Ito and Lazzaro (Final, p.5, lines 12-13).

15 333. With respect to claim 72, whether the new result of **accommodating overshoot** is obvious.
This issue has already been discussed in connection with claim 19.

20 334. With respect to claim 72, whether Ito teaches selectable regions **adjacent** a confiner.
The structural difference and functional advantage over the applied art of moving the cursor **only within** a polygon on the display has already been discussed under the above heading in connection with claim 19.

25 335. With respect to claim 72, whether Ito teaches selectable regions **adjacent** a confiner and **on the** display.
This issue has already been discussed in connection with claim 20.

30 336. With respect to claim 72, whether the proposed combination teaches circumscribing selectable regions **on the display**.
This issue has already been discussed in connection with claim 20.

337. With respect to claim 72, whether the Final provides a motivation to make the proposed

modification of Ito.

This issue has already been discussed in connection with claim 20.

338. With respect to claim 72, whether Ito and Lazzaro are combinable.

5 This issue has already been discussed in the section entitled "Issues Concerning Many Claims."

Independent claim 73 and its dependent claims

10 Independent claim 73 stands rejected on the basis of the combination of Ito as modified, Baker, Golding, and Lazzaro. (Final, p.5, lines 10-11).

339. With respect to claim 73, the proposed combination teaches circumscribing selectable regions **on** the display.

This issue has already been discussed in connection with claim 20.

15 340. With respect to claim 73, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

20 341. With respect to claim 73, whether Ito teaches selectable regions **adjacent** a confiner.

The voice output system of claim 73 includes "a display on which may be displayed a plurality of selectable regions **within** a polygon on the display, each selectable region **adjacent** a side of the polygon".

25 The structural difference and functional advantage over the applied art of moving the cursor "**within** the polygon" on the display has already been discussed under the above heading in connection with claim 19.

342. With respect to claim 73, whether Ito teaches selectable regions **adjacent** a confiner and **on** the display.

30 This issue has already been discussed in connection with claim 20.

343. With respect to claim 73, whether the new result of **accommodating overshoot** is obvious.

This issue has already been discussed in connection with claim 19.

344. With respect to claim 73, whether the new result of **increased speed** of selection is obvious.
This issue has already been discussed in connection with claim 19.

5

345. With respect to claim 73, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious.
This issue has already been discussed in connection with claim 19.

10

346. With respect to claim 73, whether the new results of **accommodating each of tremor and drift** are obvious.

The issue has already been discussed in connection with claim 19.

347. With respect to claim 73, whether the new result of **decreasing error rate** is obvious.

15

The issue has already been discussed in connection with claim 19.

348. With respect to claim 73, whether Ito, as combined with Baker, and Golding are combinable.

This issue has already been discussed in connection with claim 73.

20

349. With respect to claim 73, whether Ito and Lazzaro are combinable.

This issue has already been discussed in the section entitled "Issues Concerning Many Claims."

350. With respect to claim 73, whether Ito and Baker are combinable.

25

This issue has already been discussed in connection with claim 114.

351. With respect to claim 73, whether the Final evidences improper hindsight reconstruction of references.

This issue has already been discussed in connection with claim 114.

30

352. With respect to claim 104, whether the proposed combination teaches selection responsive to the durations of a **plurality of successive periods** of intersection.

The Final does not address the claimed limitation or combination. None of the applied references disclose or suggest such a limitation.

353. With respect to claim 104, whether Choi is **pertinent prior art**.

This issue has already been discussed in connection with claim 134.

354. With respect to claim 104, whether Choi teaches a **dwelt time indicator**.

This issue has already been discussed in connection with claim 134.

355. With respect to claim 104, whether Choi teaches a “means for indicating the difference between the predetermined period and the total duration of the plurality of periods”.

The Final correctly recites that claim 104 requires “means for indicating the difference between the predetermined period and the total duration of **the plurality of periods**” (Final, p.10, line 20 - p.11, line 2), and then erroneously concludes that “[T]he indicating feature as taught by Choi reads on the claim” (Final, p.11, line 2). This conclusion ignores the essence of the periods. Each period is a period “of intersection of the cursor and the intersected selectable region”. Choi does not teach such periods. In Choi, the level meter is not responsive to an intersection of anything with anything else, to “a movement related signal”, to “a cursor”, or to “a plurality of periods of intersection of the cursor and the intersected selectable region”. In Choi, the level meter is unaffected by the viewer. The viewer cannot increase or decrease the level shown by the level meter.

A similar issue has already been discussed in connection with claim 134 under the heading “whether Choi teaches a dwell time indicator”.

356. With respect to claim 112, whether Ito teaches selectable regions **adjacent** a confiner.

The structural difference and functional advantage over the applied art of moving the cursor **only within** a polygon on the display has already been discussed under the above heading in connection with claim 19.

Independent claim 74

Independent claim 74 stands rejected on the basis of Ito as modified. (Final, p.5, line 9).

357. With respect to claim 74, the proposed combination teaches circumscribing selectable regions

on the display.

This issue has already been discussed in connection with claim 20.

- 5 358. With respect to claim 74, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

359. With respect to claim 74, whether Ito teaches selectable regions **adjacent** a confiner.

10 The device controller of claim 74 includes “means for displaying a plurality of selectable regions **within** a polygon on a surface, each selectable region **adjacent** a side of the polygon”, and control means for “moving at least part of a cursor **only within** the polygon”.

The structural difference and functional advantage over the applied art of moving the cursor **only within** a polygon on the display has already been discussed under the above heading in connection with claim 19.

- 15 360. With respect to claim 74, whether Ito teaches selectable regions **adjacent** a confiner and **on** the display.

This issue has already been discussed in connection with claim 20.

- 20 361. With respect to claim 74, whether the new result of **accommodating overshoot** is obvious.

This issue has already been discussed in connection with claim 19.

362. With respect to claim 74, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 19.

- 25 363. With respect to claim 74, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious.

This issue has already been discussed in connection with claim 19.

- 30 364. With respect to claim 74, whether the new results of **accommodating each of tremor and drift** are obvious.

The issue has already been discussed in connection with claim 19.

365. With respect to claim 74, whether the new result of **decreasing error rate** is obvious.
The issue has already been discussed in connection with claim 19.

Independent claim 76 and its dependent claims

Independent claim 76 stands rejected on the basis of Ito as modified. (Final, p.5, line 9).

366. With respect to claim 76, whether Ito teaches **optical recognition**.

The Final does not address the claimed limitation or combination. None of the applied references disclose or suggest such a limitation.

367. With respect to claim 76, whether Ito teaches a “**common attribute for optical recognition purposes**”;

The Final does not address the claimed limitation or combination. None of the applied references disclose or suggest such a limitation.

368. With respect to claim 76, whether Ito teaches “an apparatus for **editing** a document”.

The Final does not address the claimed limitation or combination. None of the applied references disclose or suggest such a limitation.

369. With respect to claim 76, the proposed combination teaches circumscribing selectable regions **on** the display.

This issue has already been discussed in connection with claim 20.

370. With respect to claim 76, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

371. With respect to claim 77, whether Ito teaches **deleting** from a document a sequence having a common attribute for optical recognition purposes.

The Final does not address the claimed limitation or combination. None of the applied references disclose or suggest such a limitation.

Independent claim 89

Independent claim 89 stands rejected on the basis of Ito and other, unspecified, art. (Final, p.6, lines 5-8). No art other than Ito is clearly cited against this claim in the Final, as required by 37 C.F.R. §1.113(b).

5 372. With respect to claim 89, the proposed combination teaches circumscribing selectable regions **on the display**.

This issue has already been discussed in connection with claim 20.

10 373. With respect to claim 89, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

15 374. With respect to claim 89, Ito teaches teaches selection from a **plurality of pluralities of selectable regions**.

Ito's menu options are static, and are intended to be common to a plurality of application programs, as has already been discussed in connection with the issue entitled "Whether Ito and Atkinson are combinable" in the Issues Concerning Many Claims section above.

20 375. With respect to claim 89, whether the proposed combination teaches a **clipper**.

The claimed menu option selector includes "a clipper for generating, in response to the location indicated by the body member of the operator **indicating a location outside the display area**, a clipped location indicative of a location on the display area".

The Final does not address the claimed limitation or combination. None of the applied references disclose or suggest such a clipper.

25 Independent claim 164

Independent claim 164 stands rejected on the basis of the combination of Ito, Baker, Golding, and Lazzaro. (Final, p.5, lines 10-11).

30 376. With respect to claim 164, the proposed combination teaches circumscribing selectable regions **on the display**.

This issue has already been discussed in connection with claim 20.

377. With respect to claim 164, whether the Final provides a motivation to make the proposed modification of Ito.

This issue has already been discussed in connection with claim 20.

5 378. With respect to claim 164, whether Ito teaches simultaneously displayed **menu options** on the display.

This issue has already been discussed in connection with claim 114.

10 379. With respect to claim 164, whether Baker teaches **simultaneously** displayed menu options on the display.

This issue has already been discussed in connection with claim 114.

380. With respect to claim 164, whether Ito teaches selectable regions **adjacent** a confiner.

15 The device controller of claim 164 includes “a display on which may be displayed a plurality of selectable regions **within** a polygon on the display, each selectable region **adjacent** a side of the polygon”.

The structural difference and functional advantage over the applied art of moving the cursor “**within** the polygon” on the display has already been discussed under the above heading in connection with claim 19.

20 381. With respect to claim 164, whether Ito teaches selectable regions **adjacent** a confiner and **on** the display.

This issue has already been discussed in connection with claim 20.

25 382. With respect to claim 164, whether the new result of **accommodating overshoot** is obvious.

This issue has already been discussed in connection with claim 19.

383. With respect to claim 164, whether the new result of **increased speed** of selection is obvious.

This issue has already been discussed in connection with claim 19.

30 384. With respect to claim 164, whether the new result of **simultaneously** accommodating impaired fine motor control and providing space for an application program window is obvious.

This issue has already been discussed in connection with claim 19.

385. With respect to claim 164, whether the new results of **accommodating each of tremor and drift** are obvious.

5 The issue has already been discussed in connection with claim 19.

386. With respect to claim 164, whether the new result of **decreasing error rate** is obvious.

The issue has already been discussed in connection with claim 19.

10 387. With respect to claim 164, whether Ito, as combined with Baker, and Golding are combinable.

This issue has already been discussed in connection with claim 114.

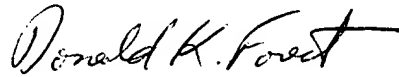
388. With respect to claim 164, whether Ito and Lazzaro are combinable.

15 This issue has already been discussed in the section entitled "Issues Concerning Many Claims."

XIII. CONCLUSION

For the reasons advanced above, Appellant respectfully urges that each of rejection of each pending claims is improper. Reversal of each of the rejections is respectfully requested.

Respectfully submitted,



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APPENDIX I

CLAIMS

1. (twice amended) An apparatus for selecting a menu option from a plurality of menu options,
5 said apparatus comprising:
 - (a) a display screen;
 - (b) means for at least partially delimiting a plurality of selectable regions, each of the
selectable regions outside the display screen and each associated respectively with a
displayed menu option;
 - 10 (c) movement related signal receiving means for receiving a movement related signal
indicating successive locations with respect to the display screen; and
 - (d) selection means, responsive to a first dwell event associated with a particular one of the
selectable regions outside the display screen, the particular selectable region intersected
by a plurality of the successive locations for selecting the menu option associated with
15 the particular selectable region.
19. In a human interface system including a display whereon a first cursor may be displayed and
moved responsive to successive locations indicated by a movement related signal, an apparatus
for selecting a menu option associated with an overshoot selectable region on the display, said
20 apparatus comprising:
 - (a) means for displaying a plurality of selectable regions within a first polygon intersecting
the display, each selectable region associated respectively with a menu option, each
selectable region adjacent a side of the first polygon and the plurality of selectable
regions together at least partially circumscribing a region on the display;

(b) movement related signal receiving means for receiving the movement related signal indicating the successive locations; and

(c) control means for

(1) moving the first cursor within the first polygon responsive to the successive locations indicated by the movement related signal;

(2) confining at least part of the first cursor to the first polygon; and

(3) in response to a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of the durations of one or more successive periods of intersection of the first cursor and one of the selectable regions, selecting the menu option associated with the intersected selectable region.

20. The apparatus of claim 19 wherein the first polygon is located on the display.

21. The apparatus of claim 20 wherein at least one of the selectable regions intersects the at least partially circumscribed region.

22. The apparatus of claim 20 wherein the control means is further operative to confine at least part of the first cursor to a second polygon on the display.

23. The apparatus of claim 22 wherein the control means is further operative to switch, responsive to an intersection of the first cursor and one of the selectable regions, from confining at least part of the first cursor to the first polygon to confining at least part of the first cursor to the second polygon .

24. (once amended) The apparatus of claim 22 wherein the control means is further operative to switch, responsive to a distance between two of the successive locations, from confining at least part of the first cursor to the first polygon to confining at least part of the first cursor to the second polygon.

5

25. The apparatus of claim 22 wherein the control means is further operative to switch, responsive to an angle indicated by three of the successive locations, from confining at least part of the first cursor to the first polygon to confining at least part of the first cursor to the second polygon.

10

26. The apparatus of claim 22 wherein the first polygon intersects the second polygon.

27. The apparatus of claim 26 wherein the first polygon includes all of the area of the second polygon.

15

28. The apparatus of claim 20 wherein the selection of the control means is further responsive to the proximity of one of the successive locations indicated by the movement related signal to the location of the first cursor.

20

29. The apparatus of claim 20 wherein the selection of the control means is further responsive to the proximity of one of the successive locations indicated by the movement related signal to the intersected selectable region.

30. The apparatus of claim 20 wherein the first polygon has at least five sides.

31. The apparatus of claim 20 wherein at least one of the plurality of selectable regions is associated with an icon on the display.

5 32. (once amended) The apparatus of claim 31 wherein the icon represents one of a sign of a manual sign language, a location relative to a human body, a topic of conversation, a sentence, a desired direction of movement of a second cursor on the display, a sequence of one or more graphics including an ideograph, and a symbol of a symbol set.

10 33. An apparatus for selecting a submenu option from a menu hierarchy, said apparatus comprising:

(a) a display area;

(b) a menu comprising a plurality of menu options, at least one of the menu options associated with a submenu comprising a plurality of submenu options;

15 (c) means for at least partially delimiting:

(1) a plurality of first selectable regions, each of the first selectable regions associated respectively with one of the menu options and each of the first selectable regions including a first subregion adjacent the display area and a first subregion on the display area, the plurality of the first subregions on the display area together at least partially circumscribing a first region on the display area; and

20 (2) a plurality of second selectable regions, each of the second selectable regions associated respectively with one of the submenu options and each of the second selectable regions including a second subregion adjacent the display area and a second subregion on the display area, the plurality of the second subregions on the

display area together at least partially circumscribing a second region on the display area;

- (d) movement related signal receiving means for receiving a movement related signal indicating successive locations with respect to the display area; and
- (e) selection means for selecting, in response to a first dwell event, the menu option associated with the first selectable region intersected by one of the successive locations indicated by the movement related signal, the menu option being one of the menu options associated with a submenu, and for selecting, in response to a second dwell event, the submenu option associated with the second selectable region intersected by one of the successive locations indicated by the movement related signal.

34. The apparatus of claim 33 wherein one of the menu options represents a group of characters and wherein a first one of the submenu options represents a first one character of the group of characters.

35. The apparatus of claim 34 wherein each character of the group of characters has one of:

- (a) an extension at least a predetermined distance above the baseline of the group of characters;
- (b) an extension below the baseline of the group of characters;
- (c) lack of the characteristic described in (a); and
- (d) lack of the characteristic described in (b).

36. The apparatus of claim 34 wherein the distance on the display area between the first subregion on the display area associated with the menu option representing the group of characters and

the second subregion on the display area associated with the submenu option representing the first one character of the group of characters is responsive to the frequency of use of the first one character.

5 37. The apparatus of claim 34 wherein:

- (a) a second one of the submenu options represents a second one character of the group of characters;
- (b) the first one character is more frequently used than the second one character; and
- (c) the distance on the display area between the first subregion on the display area
10 associated with the menu option representing the group of characters and the second subregion associated with the submenu option representing the first one character of the group of characters is less than the distance on the display area between the first subregion on the display area associated with the menu option representing the group of characters and the second subregion on the display area associated with the submenu
15 option representing the second one character of the group of characters.

38. The apparatus of claim 34 wherein the position of a character of the group of characters indicates the position of the second subregion on the display area associated with the submenu option representing the first one character of the group of characters.

20 39. (once amended) An apparatus for selecting a menu option from a plurality of menu options, said apparatus comprising:

- (a) a display area;
- (b) means for at least partially delimiting a plurality of selectable regions, each of the

selectable regions outside the display area and each associated respectively with a menu option;

(c) movement related signal receiving means for receiving a movement related signal indicating a location with respect to the display area;

(d) a plurality of indicators, each associated respectively with one of the selectable regions, for indicating which one of the selectable regions is intersected by the location; and

(e) selection means for selecting, in response to a first selection event associated with the selectable region intersected by the location, the menu option associated with the intersected selectable region.

40. (once amended) The apparatus of claim 39 wherein the first selection event includes a switch operation at or near the time the intersection occurs.

41. The apparatus of claim 39 further comprising means for indicating the menu option associated with each selectable region.

43. The apparatus of claim 39 further comprising location indication means for indicating the location of each selectable region.

44. The apparatus of claim 43 wherein the location indication means further comprises means for displaying each menu option on the display area, wherein the location of each displayed menu option indicates the location of the associated selectable region.

45 The apparatus of claim 43 where the location indication means includes means for displaying at least part of each selectable region on the display area.

5 46. (once amended) The apparatus of claim 39 wherein the first selection event includes a switch operation; and wherein the selection means further comprises switch operation receiving means for receiving a signal indicating the switch operation.

10 47. (once amended) The apparatus of claim 39 wherein the selection means is at least partially disabled in response to a second selection event.

48. (once amended) The apparatus of claim 47 wherein the selection means, in response to a third selection event, is restored to the functionality it had prior to the second selection event.

15 49. The apparatus of claim 39 wherein all or all but one of the selectable regions are partially delimited.

50. The apparatus of claim 49 wherein one of the selectable regions is completely delimited.

20 51. The apparatus of claim 49 further comprising a computer system including display means for displaying at least part of the output of an application program executable on the computer system in the region on the display area and wherein at least one of the menu options represents an input to the application program.

52. An apparatus for selecting a menu option from a plurality of menu options, said apparatus

comprising:

- (a) a surface;
- (b) means for delimiting a plurality of selectable regions on the surface, each of the selectable regions associated respectively with a menu option, the plurality of selectable regions together at least partially circumscribing a region on the surface;
- (c) a pointer, responsive to the movement of a one of an operator's limbs, digits and head, for indicating successive locations on the surface; and
- (d) selection means for selecting, in response to a dwell event, the menu option associated with the selectable region intersected by one of the successive locations indicated by the pointer.

53. (once amended) An apparatus for selecting a menu option from a plurality of menu options, said apparatus comprising:

- (a) means for displaying a plurality of selectable regions on a display area, each of the selectable regions associated respectively with a menu option, the plurality of selectable regions together at least partially circumscribing a region on the display area;
- (b) movement related signal receiving means for receiving a movement related signal indicating successive locations with respect to the display area; and
- (c) in response a quantity equalling or exceeding a predetermined quantity, the quantity being a function of the durations of a plurality of successive periods of intersection of two or more of the successive locations and one of the selectable regions, selection means for selecting the menu option associated with the intersected selectable region.

54. An apparatus for selecting an option from a menu, said apparatus comprising:

- (a) cursor movement means for receiving a movement related signal and for moving a cursor on a display responsive to the received movement signal;
- (b) delimit means for delimiting on the display a first plurality of regions and a second plurality of selectable regions, each of the second plurality of selectable regions associated respectively with a menu option; the first plurality of regions together at least partially circumscribing a first region on the display; and
- (c) selection means, responsive only to an intersection of the cursor and a first one of the first plurality of regions and thereafter to a first selection event associated with one of the second plurality of selectable regions, for selecting the menu option associated with the selectable region associated with the first selection event.

55. The apparatus of claim 54 further comprising means for receiving a switch operation signal; and wherein the delimit means includes means for displaying the first plurality of regions responsive to the received switch operation signal.

56. The apparatus of claim 54 wherein the second plurality of selectable regions together at least partially circumscribing the first region on the display.

57. The apparatus of claim 54 further comprising a third plurality of selectable regions, each of the third plurality of selectable regions associated respectively with a menu option; and wherein the selection means is further responsive to an intersection of the cursor and a second one of the first plurality of regions and thereafter to a second selection event associated with one of the third plurality of selectable regions, for selecting the menu option associated with the selectable region associated with the second selection event.

58. The apparatus of claim 54 wherein the selection means includes means for receiving a switch operation signal; and wherein the first selection event includes:

- (1) an intersection of the cursor and the selectable region associated with the second selection event; and
- (2) at or near the time the intersection occurs, receipt of the switch operation signal.

61. In a human interface system wherein a body member of an operator may indicate a location on a surface, a menu option selector comprising:

- (a) the surface including a display area, the display area having thereon a plurality of selectable regions, each of the selectable regions associated respectively with a menu option, the plurality of selectable regions together at least partially circumscribing a region on the display area;
- (b) a clipper for generating, in response to the location indicated by the body member of the operator indicating a location outside the display area, a clipped location indicative of a location on the display area; and
- (c) a selector for selecting, in response to a selection event, the menu option associated with the selectable region intersected by the clipped location.

62. The menu option selector of claim 61 wherein each of the plurality of selectable regions is adjacent an edge of the display area.

63. In a human interface system wherein a body member of an operator may indicate a location on a surface, a menu option selector comprising:

(a) the surface including a display area, the display area having thereon a plurality of selectable regions, each of the selectable regions associated respectively with a menu option, the plurality of selectable regions together at least partially circumscribing a region on the display area;

5 (b) a confiner for confining the location indicated by the body member of the operator to the display area; and

(c) a selector for selecting, in response to a selection event, the menu option associated with the selectable region intersected by the location indicated by the body member of the operator.

10

64. The menu option selector of claim 63 wherein each of the plurality of selectable regions is adjacent an edge of the display area.

65. (once amended) In a human interface system wherein a body member of an operator may indicate successive locations on a surface, a menu option selector comprising:

15

(a) a detector area on the surface, the detector area including a plurality of selectable regions, each of the selectable regions associated respectively with a menu option, the plurality of selectable regions together at least partially circumscribing a region on the surface;

20

(b) a confiner for confining the location indicated by the body member of the operator to the detector area; and

(c) a selector for selecting, in response to a dwell event associated with any one of the selectable regions, the menu option associated with the selectable region associated with the dwell event.

66. The menu option selector of claim 65 wherein each of the plurality of selectable regions is adjacent an edge of the detector area.

5 67. (once amended) An apparatus for selecting an option from a menu, said apparatus comprising:

(a) a display area;

(b) means for displaying a plurality of menu options, the display of the plurality of menu options together at least partially circumscribing a region on the display area, each menu option associated respectively with a position of a user activatable switch outside the display area, the switch being positionable with respect to the location of each menu option for selection thereof; and

10 (c) a selector for selecting a particular one of the menu options in response to a first position of the switch corresponding to the particular menu option for a period equalling or exceeding a first predetermined time period.

15 68. The apparatus of claim 67 wherein the display means is further operative to indicate the selected menu option.

20 69. (once amended) The apparatus of claim 67 further comprising a plurality of submenu options associated with the particular menu option, each of the submenu options associated respectively with a position of the switch; and wherein the display means is further operative, responsive to the selection of the particular menu option, to display the plurality of submenu options, the display of the plurality of submenu options together at least partially circumscribing the region on the display area; and wherein the selector, in response to a second

position of the switch corresponding to a specific one of the submenu options for a period equalling or exceeding a second predetermined time period, is further operative to select the specific submenu option.

5 70. For use with a general purpose computer system including a display on which a cursor may be displayed, the general purpose computer system being capable of executing an application program, an apparatus comprising:

(a) a medium readable by the general purpose computer system; and

10 (b) a program, stored on the medium and executable by the general purpose computer system, for:

(1) displaying a plurality of selectable regions within a polygon on the display, each selectable region adjacent a side of the polygon, one or more of the selectable regions each associated respectively with a sequence of one or more characters, the plurality of selectable regions together at least partially circumscribing a region on the display;

15 (2) receiving a movement related signal and moving at least part of the cursor only within the polygon responsive to the movement related signal; and

20 (3) in response to a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of the durations of one or more successive periods of intersection of the cursor and one of the one or more selectable regions, inputting the sequence of one or more characters associated with the intersected selectable region to the application program.

71. A data entry system including a computer system on which may be executed an application

program, said data entry comprising:

- (a) the computer system including a display;
- (b) a pointer selected from the group consisting of a (1) mouse; (2) trackball; (3) joystick;
(4) stylus and graphics tablet; (5) lightpen; (6) thumb wheel; (7) touch screen; (8)
5 head pointer; and (9) intraoral pointer, the pointer coupled to the computer system;
and
- (c) program means executable on the computer system for:
 - (1) displaying a plurality of selectable regions within a polygon on the display, each
selectable region adjacent a side of the polygon, the plurality of selectable regions
10 together at least partially circumscribing a region on the display;
 - (2) moving a cursor within the polygon responsive to movement of the pointer; and
 - (3) in response to a selection event and an intersection of the cursor and a selectable
region associated with an input for the application program, inputting the input to
the application program.

15
72. A computer access system for an operator having impaired motor capability, said computer
access system including a computer system on which may be executed a computer program,
said computer access system comprising:

- (a) the computer system including a display;
- (b) program means executable on the computer system for:
 - (1) displaying a plurality of selectable regions within a polygon on the display, each
selectable region adjacent a side of the polygon, the plurality of selectable regions
together at least partially circumscribing a region on the display;
 - (2) receiving a movement related signal and moving at least part of a cursor only

within the polygon responsive to the movement related signal; and

- (3) in response to a selection event and an intersection of the cursor and a selectable region associated with an input for the computer program, inputting the input to the computer program.

5

73. (twice amended) A voice output system for a user having impaired speech comprising:

- (a) a display on which may be displayed a plurality of selectable regions within a polygon on the display, each selectable region adjacent a side of the polygon and one or more of the selectable regions associated respectively with and displaying on the display a sequence of one or more letters, the plurality of selectable regions together at least partially circumscribing a region on the display;

10

- (b) a voice output device; and

- (c) control means for:

- (1) receiving a movement related signal and moving a cursor within the polygon responsive to the movement related signal;

15

- (2) in response to a succession of selection events, each associated respectively with an intersection of the cursor and one of the selectable regions associated with one of the one or more sequences of one or more letters, appending the sequence associated with the intersected selectable region to at least one previously selected sequence; and

20

- (3) speaking, by means of the voice output device, the word spelled by the appended sequences.

74. A device controller comprising:

(a) means for displaying a plurality of selectable regions within a polygon on a surface, each selectable region adjacent a side of the polygon and each selectable region associated respectively with a device control function, the plurality of selectable regions together at least partially circumscribing a region of the polygon;

(b) signal generating means coupled to a device for generating a device control signal; and

(c) control means for:

(1) receiving a movement related signal and moving at least part of a cursor only within the polygon in response to the received movement related signal; and

(2) in response to a selection event, generating a device control signal corresponding to the device control function associated with the one of the plurality of selectable regions intersected by the cursor.

75. The device controller of claim 74 wherein the device includes any one of a wheelchair, a household appliance, an appliance for use in an office, a workstation, a robot, and a computer peripheral.

76. An apparatus for editing a document, said apparatus comprising:

means for selecting a first sequence of one or more graphic symbols from a plurality of sequences of one or more graphic symbols, at least part of each of the plurality of sequences having a common attribute for optical recognition purposes;

means for inputting the first sequence into the document;

means for delimiting on a display a plurality of selectable regions, the plurality of selectable regions together at least partially circumscribing a region on the display, at least two of the selectable regions associated respectively with a sequence of the plurality of sequences;

5 means for displaying on the display the at least two sequences of the plurality of sequences associated with the at least two selectable regions;

means for receiving a movement related signal and moving a cursor on the display responsive thereto; and

10 in response to a selection event wherein the cursor at or near the time the selection event occurs intersects any one of the at least two selectable regions, means for inputting the sequence associated with the intersected selectable region into the document.

15 77. The apparatus of claim 76 further comprising means, responsive to the selection event, for deleting the first sequence from the document.

78. For use with a surface comprising a display area, a method of selecting a menu option from a plurality of menu options, said method comprising the steps of:

20 at least partially delimiting a plurality of selectable regions, each of the selectable regions associated respectively with a menu option and each of the selectable regions including an invisible subregion outside the display area and a visible subregion on the display area, the plurality of visible subregions together at least partially circumscribing

a region on the display area;

receiving a movement related signal indicating successive locations with respect to the display area; and

selecting, in response to a dwell event associated with one of the selectable regions, the menu option associated with the selectable region associated with the dwell event.

79. For use with a human interface system wherein a body member of an operator may indicate successive locations on a surface, the surface including a display area, the display area having thereon a plurality of selectable regions, each of the selectable regions associated respectively with a menu option and the plurality of selectable regions together at least partially circumscribing a region on the display area, a method of selecting a menu option from a plurality of menu options, said method comprising the steps of:

confining each of the successive locations to the display area; and

selecting, in response to a dwell event associated with one of the selectable regions, the menu option associated with the selectable region associated with the dwell event.

80. (once amended) A method of speaking using a voice output system including a display and a voice output device, said method comprising the steps of:

displaying a plurality of selectable regions within a polygon on the display, each

selectable region adjacent a side of the polygon and one or more of the selectable regions associated respectively with a sequence of one or more characters, the plurality of selectable regions together at least partially circumscribing a region on the display;

5 receiving a movement related signal and moving at least part of a cursor only within the polygon responsive to the movement related signal;

repetitively:

10 (i) in response to a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of the durations of one or more successive periods of intersection of the cursor and one of the one or more selectable regions, selecting the sequence associated with the intersected selectable region; and

15 (ii) appending the selected sequence to at least one previously selected sequence; and

speaking, by means of the voice output device, the word spelled by the appended sequences.

20 82. The apparatus of claim 22 further comprising sensor signal receiving means for receiving a sensor signal indicative of an actual or attempted muscle activation; and wherein the control means is further operative to switch, responsive to the sensor signal, from confining at least part of the first cursor to the first polygon to confining at least part of the first cursor to the second polygon .

83. The apparatus of claim 82 wherein the human interface system includes a switch and the sensor signal indicates an operation of the switch.

5 84. The apparatus of claim 22 wherein all of the area of the second polygon lies within the first polygon.

85. (once amended) An apparatus for selecting a menu option from a plurality of pluralities of menu options, said apparatus comprising:

10 (a) a surface;

(b) means for delimiting a plurality of selectable regions on the surface, the plurality of selectable regions together at least partially circumscribing a region on the surface;

(c) a pointer, responsive to the movement of a body member of a user, for indicating successive locations on the surface;

15 (d) sensor signal receiving means for receiving a sensor signal; and

(e) selection means

(1) responsive to the sensor signal, for associating each of the selectable regions respectively with the menu options of one of the plurality of menu options, and

20 (2) responsive to a quantity equalling or exceeding a predetermined quantity, the quantity being a function of the durations of one or more successive periods of intersection of two or more of the successive locations and a particular selectable region, for selecting the menu option associated with the particular selectable region.

86. The apparatus of claim 85 further comprising indicating means for indicating which plurality of menu options is associated with the selectable regions.
87. The apparatus of claim 85 wherein the selection means is further responsive to the sensor
5 signal equalling or exceeding a predetermined signal level.
88. The apparatus of claim 87 wherein the selection means is further responsive to the sensor signal equalling or exceeding the predetermined signal level for a predetermined period.
89. In a human interface system wherein a body member of an operator may indicate a location on
10 a surface, a menu option selector comprising:
- (a) the surface including a display area, the display area having thereon a plurality of pluralities of selectable regions, each of the pluralities of selectable regions at least partially circumscribing a region on the display area;
 - 15 (b) a sensor for sensing an actual or attempted muscle activation of the operator and, responsive thereto, for associating each selectable region of one of the pluralities of selectable regions respectively with a menu option;
 - (c) a clipper for generating, in response to the location indicated by the body member of the operator indicating a location outside the display area, a clipped location indicative of a
20 location on the display area; and
 - (d) a selector for selecting, in response to a selection event, the menu option associated with the selectable region intersected by the clipped location.
94. (amended three times) A voice output system for a user having impaired motor control, said

voice output system comprising:

- (a) a display screen;
- (b) a delimit device completely delimiting an invisible selectable region outside the display screen associated with a sequence of one or more words;
- (c) a voice output device;
- (d) a movement related signal receiver for receiving a movement related signal indicating successive locations with respect to the display screen; and
- (d) a selection device, responsive to a quantity equalling or exceeding a predetermined quantity, the quantity being a function of the durations of one or more successive periods of intersection of two or more of the successive locations and the selectable region outside the display screen, for selecting the selectable region;

whereby the user may select the selectable region outside the display and speak, with the voice output device, the sequence of one or more words.

101. The apparatus of claim 86 wherein the selected menu option represents a sequence of one or more words; and further comprising a voice output device for speaking the sequence of one or more words responsive to the selection means selecting the selected menu option.

102. The apparatus of claim 86 further comprising a plurality of selectable regions outside the surface, each associated respectively with one of the selectable regions on the surface; and wherein the first dwell event includes a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of:

- (a) the durations of one or more successive periods of intersection of two or more of the successive locations and one of the selectable regions on the surface; and

(b) the durations of one or more successive periods of intersection of two or more of the successive locations and the selectable region outside the surface associated with the intersected selectable region on the surface.

5 103. The apparatus of claim 86 further comprising signal generating means coupled to a device for generating a device control signal corresponding to a device control function; wherein the selected menu option represents the device control function; and wherein the signal generating means, in response to the dwell event, generates the device control signal represented by the selected menu option.

10 104. (twice amended) The apparatus of claim 73 wherein the movement related signal is responsive to the head movement of the user; wherein each of the plurality of selectable regions is adjacent an edge of the display; wherein each of the succession of selection events includes a plurality of periods of intersection of the cursor and the intersected selectable region, each
15 plurality of periods of intersection having a total duration equalling or exceeding a predetermined period; and wherein the control means further includes means for indicating the difference between the predetermined period and the total duration of the plurality of periods.

20 105. The apparatus of claim 85 wherein the sensor signal is responsive to a sound.

106. (twice amended) In voice output system for a user having impaired motor capability, an apparatus for selecting a menu option associated with an overshoot selectable subregion on a display screen, said apparatus comprising:
(a) a voice output device;

- (b) the display screen;
- (c) a menu comprising a plurality of menu options, each associated respectively with a sequence of one or more letters; and

(d) control means for:

- (1) delimiting a plurality of selectable regions, each of the selectable regions associated respectively with one of the plurality of menu options, and each of the selectable regions including a subregion outside and adjacent the display screen and a subregion on the display screen, the subregion outside and adjacent the display screen and the subregion on the display screen adjacent one another, the plurality of the subregions on the display screen together at least partially circumscribing a region on the display screen;
- (2) receiving a movement related signal indicating successive locations with respect to the display screen;
- (3) in response to a succession of dwell events, each including an intersection of a first one and a second one of the successive locations and one of the subregions outside and adjacent the display screen, selecting the sequence of one or more letters associated with each of the intersected subregions, and appending the selected sequence to at least one previously selected sequence; and
- (4) speaking, by means of the voice output device, the word spelled by the appended sequences.

108 The apparatus of claim 1 wherein at least one of the selectable regions is completely delimited.

112. The apparatus of claim 73 wherein the control means moves the cursor only with the polygon.

113. (once amended) The apparatus of claim 106 wherein each of the succession of dwell events includes a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of the difference in time between the occurrence of the second successive location and the first successive location.

114. (once amended) A voice output system comprising:

- (a) a display screen including a working region with a periphery;
- (b) a movement related signal receiver for receiving a movement related signal indicating a location with respect to the display screen responsive to user movement by a user, the user movement indicating a potential user selection;
- (c) a delimit device for delimiting selectable regions adjacent the periphery of the working region, each of the selectable regions selectable by the user and having an external boundary wherein the external boundary includes the side of the selectable region furthest from the working region and having either a confiner for preventing the movement related signal indicating the location from moving beyond the external boundary of the selectable region or having an activation area extending beyond the external boundary of the selectable region and beyond the display screen, each of the selectable regions associated respectively with and simultaneously displaying a first sequence of one or more characters, a first sequence of one or more words, or a first sequence of one or more symbols representing the first sequence of one or more words; and
- (d) a voice output device for speaking the first sequence of one or more characters and/or words associated with a first particular selectable region responsive to a first intersection

of the movement related signal and the first particular selectable region or the activation area associated therewith, thereby providing the user with the ability to select the first particular selectable region while overshooting the first particular selectable region or by providing a confiner to the first particular selectable region for the movement related signal.

115. The voice output system of claim 114 wherein the voice output device is further responsive to a period of the intersection of the movement related signal and the first particular selectable region or the activation area associated therewith, the period of intersection equalling or exceeding a predetermined period.

116. The voice output system of claim 115 wherein the voice output device is only responsive to the period of the intersection of the movement related signal and the first particular selectable region or the activation area associated therewith equalling or exceeding the predetermined period for speaking the first sequence of one or more characters and/or words associated with the first particular selectable region.

117. The voice output system of claim 115 wherein the predetermined period equals or exceeds two hundred milliseconds.

118. The voice output system of claim 114 wherein none of the selectable regions is adjacent another of the selectable regions.

119. (twice amended) The voice output system of claim 114 wherein the delimit device is further

operative to delimit a second selectable region outside the working region and adjacent one of the first selectable regions, the second selectable region selectable by the user and having an external boundary wherein the external boundary includes the side of the second selectable region furthest from the working region, the second selectable region having a confiner for preventing the movement related signal indicating the location from moving beyond the external boundary of the second selectable region or having an activation area extending beyond the external boundary of the second selectable region, the second selectable region associated with a second sequence of one or more characters, a second sequence of one or more words, or a second sequence of one or more symbols representing the second sequence of one or more words.

120. (once amended) The voice output system of claim 114 wherein a particular confiner of at least one of the selectable regions is further operative to confine the movement related signal within a particular side of the selectable region other than the external boundary.

121. (once amended) The voice output system of claim 120 wherein the particular confiner, responsive to any one of:

- (a) a path of the movement related signal;
- (b) a change of direction of the movement related signal;
- (c) a velocity of the movement related signal;
- (d) an acceleration or deceleration of the movement related signal; and
- (e) a change in the acceleration or deceleration of the movement related signal;

may allow the movement related signal to pass through the particular side of the selectable region.

122. (once amended) The voice output system of claim 114 wherein a first cursor is displayed on the display screen at or near the location indicated by the movement related signal and a second cursor differing in appearance from the first cursor is displayed on the display screen responsive to the location indicated by the movement related signal intersecting or nearly intersecting the external boundary of the particular of the selectable region.

123. The voice output system of claim 114 wherein the voice output device is further responsive to an intersection of the movement related signal and one of the selectable regions for repeating the previously spoken first sequence of one or more words.

124. The voice output system of claim 123 wherein the repeated sequence of one or more words is spoken either more loudly or more slowly than the previously spoken sequence.

125. The voice output system of claim 114 wherein the previously selected first sequence may be deleted prior to being spoken by the voice output device, the deletion being responsive to an intersection of the movement related signal and one of the selectable regions..

126. (once amended) The voice output system of claim 114 wherein each of the selectable regions is located outside the display screen.

127. (once amended) The voice output system of claim 126 further comprising indicators on the display screen, each indicator associated respectively with one of the selectable regions and indicating the location of the associated selectable region.

128. The voice output system of claim 127 wherein the first particular indicator associated with the first particular selectable region may indicate the intersection of the movement related signal and the first particular selectable region.

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129. The voice output system of claim 114 wherein the voice output device is at least partially disabled in response to an intersection of the movement related signal and one of the selectable regions or the activation area associated therewith.

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130. The voice output system of claim 129 wherein the voice output device, in response to an intersection of the movement related signal and one of the selectable regions or the activation area associated therewith, is restored to the functionality it had prior to the at least partial disabling of the voice output device.

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131. The voice output system of claim 114 further comprising a computer system capable of executing an application program which may display at least part of its output in the working region; and wherein at least one of the first sequence of characters, words, or symbols represents an input to the application program.

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132. (once amended) The voice output system of claim 131 further comprising a pointer selected from the group consisting of a (1) mouse; (2) trackball; (3) joystick; (4) stylus and graphics tablet; (5) lightpen; (6) thumb wheel; (7) touch screen; (8) head pointer; (9) intraoral pointer; and (10) eye tracker, the pointer coupled to the computer system; and wherein the movement related signal is responsive the pointer and the pointer is responsive to the user movement.

133. (once amended) The voice output system of claim 114 wherein the user movement is the movement of a body member of the user including any one of:

- (a) the head of the user;
- (b) an eye of the user;
- (c) a shoulder of the user;
- (d) an arm of the user;
- (e) an elbow of the user;
- (f) a wrist of the user;
- (g) a hand of the user;
- (h) a finger of the user;
- (i) a thumb of the user;
- (j) a knee of the user;
- (k) a leg of the user;
- (l) a foot of the user;
- (m) a toe of the user;
- (n) an ankle of the user; and
- (o) the trunk of the user.

134. (once amended) A voice output system comprising:

- (a) a surface including a selectable region selectable by a user and associated with a sequence of one or more characters, a sequence of one or more words, or a sequence of one or more symbols representing a sequence of one or more words;
- (b) movement related signal receiving means for receiving a movement related signal

indicating a first location intersecting the selectable region and, at a later time, a second location intersecting the selectable region;

(c) an indicator for indicating in a first manner at least the difference between the time the second location occurs and the time the first location occurs; and

(d) a voice output device for speaking the sequence of one or more characters and/or words associated with the selectable region responsive to a first quantity that is a function of the difference equalling or exceeding a predetermined quantity.

135. The voice output system of claim 134 wherein the indication of the difference includes any one of:

(a) a visible signal;

(b) an audible signal; and

(c) a tactile signal.

136. (once amended) The voice output system of claim 134 wherein the indicator is further operative to indicate a second quantity which is a function of the difference between

(a) a predetermined period; and

(b) the difference between the time the second location occurs and the time the first location occurs.

137. The voice output system of claim 134 wherein the movement related signal further indicates, at a time later than the time the second location occurs, a third location not intersecting the selectable region and the indicator is further operative to indicate the non-intersection of the third location and the selectable region.

138. The voice output system of claim 134 wherein the movement related signal further indicates, at a time later than the time the second location occurs, a third location not intersecting the selectable region and, at a later time, indicates a fourth location not intersecting the selectable region and the indicator is further operative to indicate at least the difference between the time the fourth location occurs and the time the third location occurs.

139. The voice output system of claim 138 wherein the indicator is further operative to produce an output signal which varies in at least one way as the difference between the time the second location occurs and the time the first location occurs increases and varies in at least the opposite way as the difference between the time the fourth location occurs and the time the third location occurs increases.

140. The voice output system of claim 134 wherein the indication in the first manner includes a modification in brightness.

141. The voice output system of claim 134 wherein the indicator is further operative to indicate in a second manner the first quantity equalling or exceeding the predetermined quantity.

142. (once amended) The voice output system of claim 141 wherein the indication in the first manner includes a slight modification and the indication in the second manner includes a marked modification.

143. The voice output system of claim 141 wherein the indication in the second manner includes a

modification in hue.

144. The voice output system of claim 134 wherein the indicator intersects the selectable region.

5 145. The voice output system of claim 144 wherein the indicator and the selectable region are coterminous.

146. The voice output system of claim 134 further comprising a confiner for preventing the movement related signal indicating the first and second locations from moving beyond a side
10 of the selectable region.

147. (once amended) A voice output system comprising:

- (a) a display area including a working region with a periphery;
- (b) a movement related signal receiver for receiving a movement related signal indicating a
15 location with respect to the display area responsive to user movement by a user, the user movement indicating a potential user selection;
- (c) a menu hierarchy including a menu comprising a plurality of menu options, a specific one of the menu options associated with a submenu comprising a plurality of submenu options, each of the submenu options associated respectively with a sequence of one or
20 more characters, a sequence of one or more words, or a sequence of one or more symbols representing the sequence of one or more words;
- (d) a delimit device for delimiting a first and second plurality of selectable regions adjacent the periphery of the working region, each of the selectable regions selectable by the user and having an external boundary wherein the external boundary includes the side of the

selectable region furthest from the working region and having either a confiner for preventing the movement related signal indicating the location from moving beyond the external boundary of the selectable region or having an activation area extending beyond the external boundary of the selectable region and beyond the display area, a specific one of the first plurality of selectable regions associated with the specific menu option and each of the second plurality of selectable regions associated respectively with and simultaneously displaying one of the submenu options; and

- (e) a voice output device for speaking the particular sequence of one or more characters and/or words associated with a particular one of the second plurality of selectable regions responsive to a first intersection of the movement related signal and the specific selectable region or the activation area associated therewith and thereafter to a second intersection of the movement related signal and the particular selectable region or the activation area associated therewith, thereby providing the user with the ability to select each of the specific and the particular selectable regions while overshooting the specific or the particular selectable region or by providing a confiner to the specific or the particular selectable region for the movement related signal.

148. (once amended) The voice output system of claim 147 wherein the specific menu option either includes at least part of the particular sequence, or represents a class of characters or words, the class including the particular sequence.

149. (once amended) The voice output system of claim 148 wherein the class is any one of:

- (a) a class of characters having a common element in Morse code;
- (b) a part of speech;

- (c) a meaning;
- (d) a physical characteristic;
- (e) a functional characteristic;
- (f) a direction;
- 5 (g) a class of characters having an extension at least a predetermined distance above a
baseline; and
- (h) a class of characters having an extension below a baseline.

10 150. The voice output system of claim 148 wherein, responsive to the selection of the specific
selectable region, the individual characters, words, or symbols associated therewith are
associated respectively with and simultaneously displayed by the second plurality of selectable
regions for eventual selection by the user.

15 151. The voice output system of claim 148 wherein the distance on the display area between the
specific selectable region and each of at least two of the second plurality of selectable regions
is responsive to a relative frequency of the use of the sequence of characters, words, or
symbols associated with each of the at least two selectable regions.

20 152. (once amended) The voice output system of claim 151 wherein the sequence of characters,
words, or symbols associated with one of the at least two selectable regions is more frequently
used than the sequence of characters, words, or symbols associated with another one of the at
least two selectable regions; and the distance between the specific selectable region and the
one of the at least two first selectable regions associated with the more frequently used
sequence is less than the distance between the specific selectable region and the another one of

the at least two first selectable regions.

153. The voice output system of claim 148 wherein the position of at least two characters, words, or symbols within the displayed specific sequence indicates the position of the one of the second plurality of selectable regions on the display area associated with the character, word, or symbol.

154. (once amended) The voice output system of claim 147 wherein the particular sequence includes a sequence of one or more symbols, at least one symbol of the particular sequence representing any one of a letter of a sign alphabet, a sign of a sign language, a topic of conversation, a sentence, a sequence of one or more graphics including an ideograph, and a symbol of a symbol set including but not limited to the Picture Communication Symbols symbol set, the Rebus symbol set, the Picsyms symbol set, the Pictogram Ideogram Communication Symbols symbol set, the Yerkish symbol set, the Blissymbolics symbol set, the Self-Talk symbol set, the Imaginart symbol set, the DynaSyms symbol set, the Oakland Picture Dictionary symbol set, the Talking Pictures symbol set, the Minspeak symbol set, the Unity symbol set, and the Core Picture Vocabulary symbol set.

155. (once amended) A voice output system comprising:

- (a) a display area including a working region with a periphery;
- (b) a movement related signal receiver for receiving a movement related signal indicating a location with respect to the display area responsive to user movement by a user, the user movement indicating a potential user selection;
- (c) a delimit device for delimiting selectable regions adjacent the periphery of the working

region, each of the selectable regions selectable by the user and having an external boundary wherein the external boundary includes the side of the selectable region furthest from the working region and having either a confiner for preventing the movement related signal indicating the location from moving beyond the external boundary of the selectable region or having an activation area extending beyond the external boundary of the selectable region and beyond the display area, each of the selectable regions associated respectively with and simultaneously displaying a sequence of one or more characters, a sequence of one or more words, or a sequence of one or more symbols representing the sequence of one or more words; and

- (d) a voice output device for speaking the sequence of one or more characters and/or words associated with a particular selectable region responsive to a quantity equalling or exceeding a predetermined quantity, the quantity being a function of the duration of a plurality of periods of intersection of the movement related signal and the particular selectable region or the activation area associated therewith,

thereby providing the user with the ability to select the particular selectable region while overshooting the particular selectable region or by providing a confiner to the particular selectable region for the movement related signal.

156. The voice output system of claim 155 wherein the quantity is further a function of the duration of a period of non-intersection of the movement related signal and the particular selectable region or the activation area associated therewith.

157. The voice output system of claim 157 wherein the quantity varies one way as the duration of one of the periods of intersection increases and varies in an opposite way as the duration of the

period of non-intersection increases.

158. (once amended) An apparatus for selecting a menu option from a plurality of menu options, said apparatus comprising:

- 5 (a) a display area including a working region with a periphery;
- (b) a movement related signal receiver for receiving a movement related signal indicating a location to be selected with respect to the display area responsive to a user selection by a user;
- (c) a delimit device for delimiting selectable regions adjacent the working region, each of
10 the selectable regions having an external boundary wherein the external boundary is the side of the selectable region furthest from the working region, each of the selectable regions having a confiner for preventing the movement related signal indicating the location from moving beyond the external boundary of the selectable region or having an activation area extending beyond the external boundary of the selectable region, each of
15 the selectable regions associated respectively with one of the menu options; and
- (d) a selection device for selecting the menu option associated with a particular one of the selectable regions responsive to an intersection of the movement related signal and the particular selectable region or the activation area associated therewith, thereby providing the user with the ability to select the particular selectable region while overshooting the
20 particular selectable region with the movement related signal or by providing a confiner to the particular selectable region for the movement related signal.

159. (once amended) A voice output system comprising:

- (a) a display area including a working region with a periphery;

- (b) a display device for displaying menu options on the display area, each menu option displayed adjacent the periphery of the working region, each menu option associated respectively with a position of a user activatable switch outside the display area, the switch being positionable with respect to the location of each menu option for selection thereof, each menu option associated respectively with a sequence of one or more characters, a sequence of one or more words, or a sequence of one or more symbols representing a sequence of one or more words, for selection via the switch; and
- (c) a voice output device for speaking the sequence of one or more characters or words associated with a particular menu option, in response to the position of the switch corresponding to the particular menu option for a period equalling or exceeding a predetermined time period.

160. (twice amended) A voice output system comprising:

- (a) a display area including a working region with a periphery;
- (b) a display device for displaying menu options on the display area, each menu option displayed adjacent the periphery of the working region, each menu option associated respectively with a position of a user activatable switch outside the display area, the switch being positionable with respect to the location of each menu option for selection thereof, each menu option associated respectively with a sequence of one or more characters, a sequence of one or more words, or a sequence of one or more symbols representing a sequence of one or more words, for selection via the switch; and
- (c) a voice output device for speaking the sequence of one or more characters or words associated with a particular menu option, in response to the position of the switch corresponding to the particular menu option for a first time period equalling or

exceeding a predetermined time period; and wherein the display device further includes an indicator for indicating at least the difference between the first time period and the predetermined time period.

5 161. (twice amended) A voice output system comprising:

- (a) a display area including a working region with a periphery;
- (b) a menu hierarchy including a menu comprising a plurality of menu options, a specific one of the menu options associated with a submenu comprising a plurality of submenu options, each of the submenu options associated respectively with a sequence of one or more
10 more characters, a sequence of one or more words, or a sequence of one or more symbols representing the sequence of one or more words;
- (c) a display device for displaying menu options and submenu options on the display area, each menu option displayed adjacent the periphery of the working region, each menu option associated respectively, and each submenu option associated respectively, with a
15 position of a user activatable switch outside the display area, the switch being positionable with respect to the location of each menu option or submenu option for selection thereof; and
- (d) a voice output device for speaking the particular sequence of one or more characters or words associated with a particular one of the submenu options, in response to the
20 position of the switch corresponding to the specific menu option for a first time period equalling or exceeding a first predetermined time period and thereafter to the position of the switch corresponding to the particular menu option for a second time period equalling or exceeding a second predetermined time period.

162. (once amended) A voice output system comprising:

- (a) a display area including a working region with a periphery;
- (b) a display device for displaying menu options on the display area, each menu option displayed adjacent the periphery of the working region, each menu option associated respectively with a position of a user activatable switch outside the display area, the switch being positionable with respect to the location of each menu option for selection thereof, each menu option associated respectively with a sequence of one or more characters, a sequence of one or more words, or a sequence of one or more symbols representing a sequence of one or more words, for selection via the switch; and
- (c) a voice output device for speaking the particular sequence of one or more characters or words associated with a particular one of the menu options, in response a quantity equalling or exceeding a predetermined quantity, the quantity being a function of the duration of a plurality of periods in which the position of the switch corresponds to the particular menu option.

163. (once amended) A method of speaking for an individual having impaired motor capability and impaired speech, said method comprising the steps of:

simultaneously displaying selectable regions adjacent a working region on a display, one or more of the selectable regions associated respectively with a sequence of one or more characters, a sequence of one or more words, or a sequence of one or more symbols representing a sequence of one or more words;

receiving a movement related signal indicating a location with respect to the display, the

movement related signal responsive to user movement indicating a potential user selection;

speaking the sequence of one or more characters or words associated with a particular selectable region responsive to a period of intersection of the particular selectable region and the location indicated by the movement related signal or the location on the display closest thereto, the period equalling or exceeding a predetermined period, whereby the user may make a selection although the user movement overshoots the particular selectable region on the display.

164. select overshoot SR, complete and speak word; 1379.

164. In voice output system for a user having impaired motor capability, an apparatus for spelling and speaking a word, said apparatus comprising:

- (a) a voice output device;
- (b) a plurality of sequences of one or more letters, which, when appended in a particular order, spell a word;
- (c) a display on which may be displayed a plurality of selectable regions within a polygon on the display, each selectable region adjacent a side of the polygon, the plurality of selectable regions together at least partially circumscribing a region on the display, each of the selectable regions associated respectively with and displaying on the display one of the sequences of one or more letters; and
- (d) control means for:
 - (1) receiving a movement related signal and moving a cursor within the polygon responsive to the movement related signal;

- (2) in response to a first selection event associated with an intersection of the cursor and one of the selectable regions, first selecting the sequence associated with the intersected selectable region;
- (3) in response to a succession of selection events, each associated respectively with an intersection of the cursor and one of the selectable regions, successively appending the sequence of one or more letters associated with the intersected selectable region to the first selected sequence in the particular order; and
- (4) speaking, by means of the voice output device, the word.

165. An apparatus for voice output comprising:

- (a) a medium readable by a general purpose computer system including a voice output device and a display screen, the display screen including a working region with a periphery; and
- (b) a program, stored on the medium and executable by the general purpose computer system, for:
 - (1) receiving a movement related signal indicating a location with respect to the display screen responsive to user movement by a user, the user movement indicating a potential user selection;
 - (2) delimiting selectable regions adjacent the periphery of the working region, each of the selectable regions selectable by the user and having an external boundary wherein the external boundary includes the side of the selectable region furthest from the working region;
 - (3) either preventing the movement related signal indicating the location from moving beyond the external boundary of the selectable region or delimiting an activation

area extending beyond the external boundary of the selectable region and beyond the display screen, each of the selectable regions associated respectively with and capable of simultaneously displaying a first sequence of one or more characters, a first sequence of one or more words, or a first sequence of one or more symbols representing the first sequence of one or more words; and

- (4) speaking with the voice output device the first sequence of one or more characters and/or words associated with a first particular selectable region responsive to a first intersection of the movement related signal and the first particular selectable region or the activation area associated therewith, thereby providing the user with the ability to select the first particular selectable region while overshooting the first particular selectable region or by preventing the movement related signal from moving beyond the external boundary of the first particular selectable region.

166. An apparatus for selecting a menu option from a plurality of menu options, said apparatus comprising:

- (a) a medium readable by a general purpose computer system including a display screen, the display screen including a working region with a periphery; and
- (b) a program, stored on the medium and executable by the general purpose computer system, for:
- (1) at least partially delimiting a plurality of selectable regions, each of the selectable regions outside the display screen and each associated respectively with a displayed menu option;
- (2) receiving a movement related signal indicating successive locations with respect to the display screen; and

- (3) responsive to a first dwell event associated with a particular one of the selectable regions outside the display screen, the particular selectable region intersected by a plurality of the successive locations, selecting the menu option associated with the particular selectable region.

5

167. The apparatus of claim 147 wherein the delimit device is further operative to delimit a shared region on the display screen, and wherein one of the first selectable regions and one of the second selectable regions each includes the shared region.

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168. The apparatus of claim 147 wherein the delimit device is further operative to delimit a plurality of shared regions, each shared region on the display screen and each associated respectively with one of the first plurality of selectable regions and with one of the second plurality of selectable regions; and wherein each of the first selectable regions and each of the second selectable regions includes the associated shared region.

15

169. (once amended) The voice output system of claim 114 wherein the voice output device is further responsive to a path of the user movement to the first particular selectable region or the activation area associated therewith.

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170. An apparatus for selecting a menu option from a plurality of menu options, said apparatus comprising:

- (a) a display screen;
- (b) a delimit device for at least partially delimiting a plurality of selectable regions, each of the selectable regions outside the display screen and each associated respectively with a

displayed menu option;

- (c) a movement related signal receiver for receiving a movement related signal indicating successive locations with respect to the display screen; and
- (d) a selection device, responsive to a first dwell event associated with a particular one of the selectable regions outside the display screen, the particular selectable region intersected by a plurality of the successive locations, for selecting the particular menu option associated with the particular selectable region.

171. The apparatus of claim 170 further comprising a pointer, responsive to the movement of a body member of an operator, for generating the movement related signal, the body member of the operator including any one of:

- (a) the head of the operator;
- (b) an eye of the operator;
- (c) a shoulder of the operator;
- (d) an arm of the operator;
- (e) an elbow of the operator;
- (f) a wrist of the operator;
- (g) a hand of the operator;
- (h) a finger of the operator;
- (i) a thumb of the operator;
- (j) a knee of the operator;
- (k) a leg of the operator;
- (l) a foot of the operator;
- (m) a toe of the operator;

(n) an ankle of the operator; and

(o) the trunk of the operator.

5 172. The apparatus of claim 170 wherein the first dwell event includes a plurality of periods of intersection, each of two or more of the successive locations and the particular selectable region.

173. The apparatus of claim 170 wherein the particular selectable region is not completely visible.

10 174. The apparatus of claim 170 wherein at most one of the selectable regions is adjacent the display screen.

15 175. The apparatus of claim 170 wherein each of the successive locations is relative to a predetermined location on the display screen or to a previous location of the successive locations.

20 176. The apparatus of claim 170 wherein the first dwell event includes a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of the durations of one or more successive periods of intersection of two or more of the successive locations and the particular selectable region.

177. The apparatus of claim 170 wherein the first dwell event includes a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of a ratio between:
(1) the durations of one or more successive periods of intersection of two or more of the

successive locations and the particular selectable region; and

- (2) the durations of one or more successive periods of intersection of two or more of the successive locations and one of the selectable regions other than the particular selectable region.

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178. The apparatus of claim 170 further comprising a plurality of selectable regions on the display screen, each associated respectively with one of the selectable regions outside the display screen; and wherein the selection device is further operative, responsive to a second dwell event associated with a certain one of the selectable regions on the display screen, the certain selectable region associated with the particular selectable region, to select the particular menu option.

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179. The apparatus of claim 178 wherein each of one or more of the selectable regions on the display screen is adjacent the associated selectable region outside the display screen.

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180. The apparatus of claim 178 wherein each of one or more of the selectable regions on the display screen indicates the location of the associated selectable region outside the display screen.

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181. The apparatus of claim 178 wherein the plurality of selectable regions on the display screen together at least partially circumscribe a region on the display screen.

182. The apparatus of claim 170 further comprising an indicator for indicating the remaining dwell time required to select the intersected selectable region.

183. The apparatus of claim 170 wherein the movement related signal is responsive to the movement of a body member of an operator having impaired ability to sense the position of the body member and the apparatus further comprises a tactile indicator for indicating tactilely to the operator the position of the body member.

184. The apparatus of claim 170 further comprising an indicator for indicating on the display screen the location of one of the successive locations located outside the display screen.

185. The apparatus of claim 170 further comprising an indicator for indicating on the display screen the distance between one of the successive locations located outside the display screen and the point on the display screen closest thereto.

186. The apparatus of claim 170 further comprising an operator fatigue detector for detecting operator fatigue and wherein the first quantity is further a function of detected operator fatigue.

187. The apparatus of claim 170 wherein the first dwell event includes a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of the duration of a period of intersection of two of the successive locations and the particular selectable region; and wherein the apparatus further includes an indicator for indicating the remaining dwell time required to select the particular menu option.

188. The apparatus of claim 187 further comprising a certain selectable region on the display screen, the certain selectable region associated with the particular selectable region; and

wherein the first quantity is further a function of the duration of a period of intersection of two of the successive locations and the certain selectable region.

- 5 189. The apparatus of claim 170 wherein the particular menu option is associated with a submenu comprising a plurality of submenu options each associated respectively with one of the selectable regions; and wherein the selection device is further operative:
- (a) to display on the display screen the submenu options, responsive to the first dwell event; and
 - (b) to select, responsive to a second dwell event, the submenu option associated with the 10 selectable region associated with the second dwell event.
190. The apparatus of claim 170 wherein the particular selectable region is invisible.
- 15 191. The apparatus of claim 170 wherein the particular menu option is associated with a submenu comprising a plurality of submenu options each associated respectively with one of the selectable regions; and wherein the selection device is further operative to select, responsive to a second dwell event, the submenu option associated with the selectable region associated with the second dwell event.
- 20 192. The apparatus of claim 170 wherein the particular menu option represents a sequence of one or more words; and further comprising a voice output device for speaking the sequence of one or more words responsive to the selection device selecting the particular menu option.
193. The apparatus of claim 192 wherein the particular selectable region is invisible.

194. The apparatus of claim 192 wherein the selection device is responsive only to the first dwell event.

5 195. The apparatus of claim 170 further comprising a certain selectable region on the display screen, the certain selectable region associated with the particular selectable region; and wherein the first dwell event includes a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of:

(a) the durations of one or more successive periods of intersection of two or more of the
10 successive locations and the certain selectable region; and

(b) the durations of one or more successive periods of intersection of two or more of the successive locations and the particular selectable region.

196. The apparatus of claim 170 further comprising a signal generating device, coupled to a device,
15 for generating a device control signal corresponding to a device control function for controlling the device; wherein the particular menu option represents the device control function; and wherein the signal generating device, in response to the first dwell event, generates the device control signal.

20 197. The apparatus of claim 196 wherein the device includes any one of:

- (a) a computer peripheral;
- (b) a device capable of playing previously recorded sound;
- (c) a device capable of playing previously recorded video;
- (d) a household appliance;

- (e) a lamp;
- (f) a microprocessor;
- (g) a motorized transport device including either one of a scooter and a wheelchair;
- (h) a radio;
- 5 (i) a robot;
- (j) a security system;
- (k) a television;
- (l) a thermostat;
- (m) a voice output device;
- 10 (n) a workstation;
- (o) an alarm; and
- (p) an office appliance.

198. An apparatus for speaking a sequence of one or more words, said apparatus comprising:

- 15 (a) a voice output device;
- (b) a plurality of sequences of one or more words, or a plurality of sequences of one or more symbols each sequence of one or more symbols representing one of the sequences of one or more words;
- (c) a display screen including a working region with a periphery, the display screen capable
20 of displaying a plurality of selectable regions adjacent the periphery of the working region, each of the selectable regions selectable by the user, each of the selectable regions associated respectively with and simultaneously displaying on the display screen one of the sequences of one or more words or symbols; and
- (d) control means for:

- (1) receiving a movement related signal indicating a location with respect to the display screen responsive to user movement by a user, the user movement indicating a potential user selection;
- (2) in response to an intersection of the location and a particular one of the selectable regions, speaking, by means of the voice output device, the sequence of one or more words associated with the particular selectable region.

199. The voice output system of claim 114 further comprising:

- (a) a computer system including the display screen and the movement related signal receiver; and

- (b) a program, executable on the computer system;

and wherein each of the delimit device and the selection device is formed by the combination of the program and the computer system.

200. The voice output system of claim 114 wherein the voice output device is further responsive to a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of a ratio between:

- (1) the durations of one or more successive periods of intersection of the movement related signal and the first particular selectable region or the activation area associated

therewith; and

- (2) the durations of one or more successive periods of intersection of the movement related signal and one of the selectable regions or the activation area associated therewith other than the particular selectable region.

201. The voice output system of claim 114 wherein the location indicated by the movement related signal is outside the display screen; and further comprising an indicator for indicating on the display screen the distance between the location indicated by the movement related signal outside the display screen and the point on the display screen closest thereto.

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202. The voice output system of claim 115 further comprising a user fatigue detector for detecting fatigue of the user; and wherein the predetermined period is a function of detected user fatigue.

203. The voice output system of claim 147 wherein the specific menu option represents a class of related words, related sequences of words, or a combination thereof, the class including the particular sequence; and wherein the class includes any one of:

10

(a) actions;

(b) amounts;

(c) animals;

15

(d) articles of clothing;

(e) bodily functions;

(f) buildings;

(g) business activities;

(h) cleaning activities;

20

(i) colors;

(j) communication activities;

(k) computer peripherals;

(l) days;

(m) devices used to maintain personal hygiene;

- (n) directions;
- (o) drinks;
- (p) emergency conditions;
- (q) emotions;
- 5 (r) financial activities;
- (s) foods;
- (t) government services;
- (u) greetings;
- (v) holidays;
- 10 (w) household appliances;
- (x) illnesses;
- (y) items of office equipment;
- (z) jokes;
- (aa) lengths;
- 15 (ab) locations, including locations frequented by an operator of the voice output system;
- (ac) meals;
- (ad) means of transportation;
- (ae) months;
- (af) names;
- 20 (ag) numbers;
- (ah) parts of the human body;
- (ai) persons known to an operator of the voice output system;
- (aj) plants;
- (ak) prosthetic devices;

- (al) recreational activities;
- (am) rehabilitation activities;
- (an) relative locations;
- (ao) school activities;
- 5 (ap) shapes;
- (aq) shopping activities;
- (ar) sizes;
- (as) smells;
- (at) sports;
- 10 (au) tactile attributes;
- (av) tastes;
- (aw) telephone numbers;
- (ax) temperatures;
- (ay) times;
- 15 (az) topics of study;
- (ba) utterances used as acknowledgements in conversation without conveying new
substantive information;
- (bb) utterances used to bid for a turn to speak in conversation;
- (bc) weights; and
- 20 (bd) work activities.

204. The apparatus of claim 1 wherein the movement related signal receiving means is not flush against the display screen.

205. The apparatus of claim 1 wherein the movement related signal indicating successive locations is responsive to movement of a body member of a user over a one dimensional range of motion of the body member; and wherein the successive locations intersect the particular selectable region over at least five percent of the range of motion of the body member.

APPENDIX II
CLAIM TREE

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APPENDIX III
SELECTED FIGURES FROM SPECIFICATION

PRIOR ART

FIG. 1

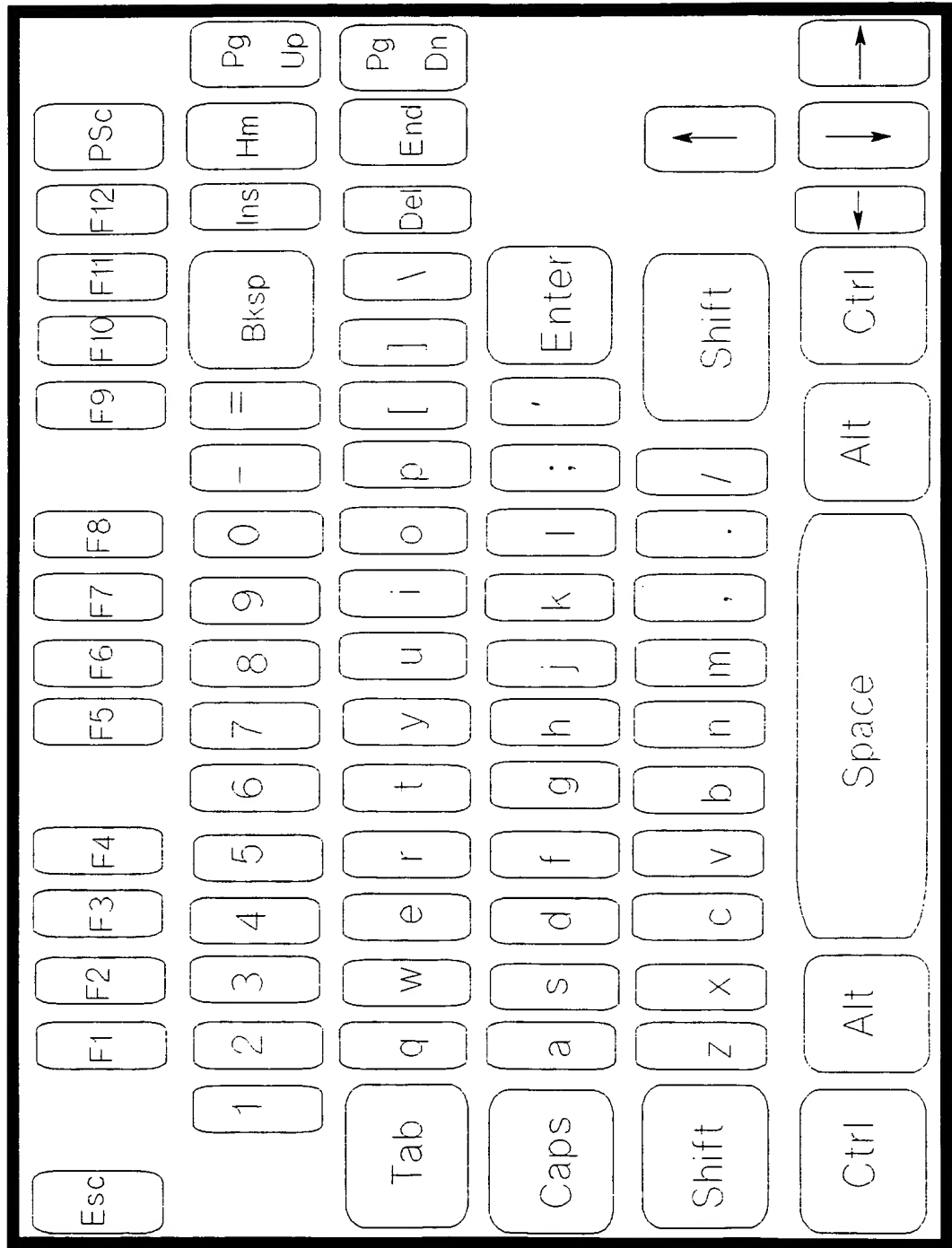


FIG. 2

PRIOR ART

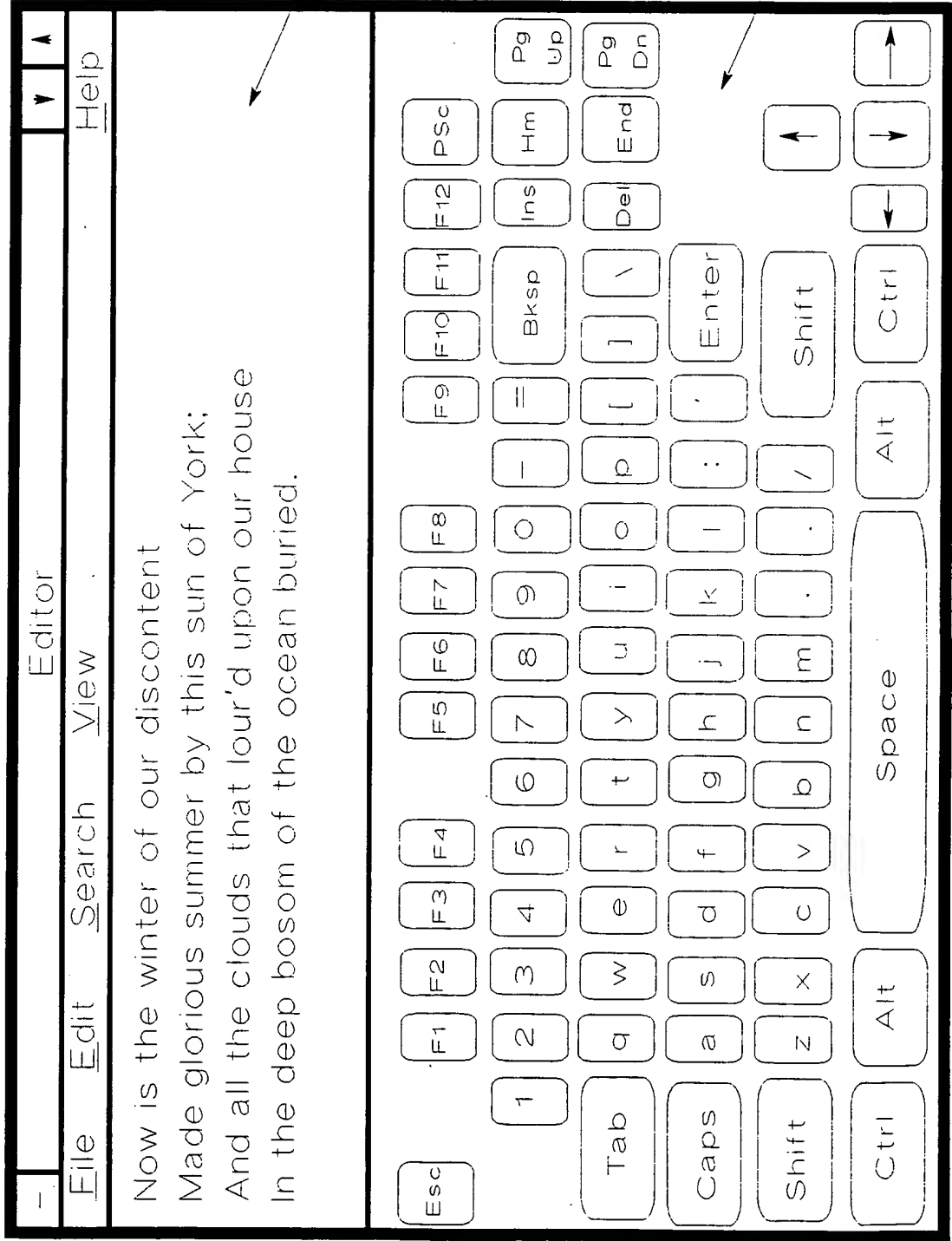
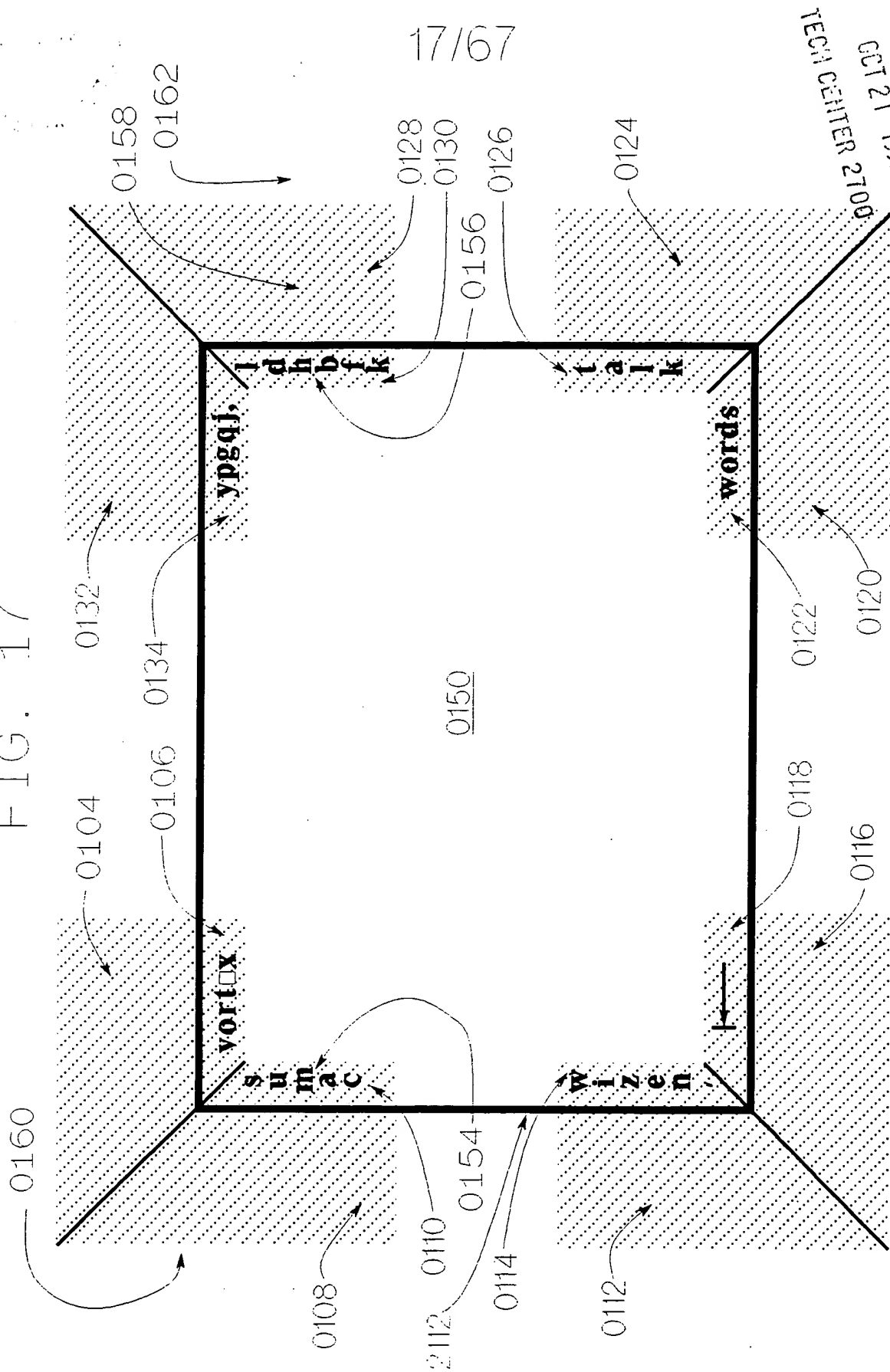


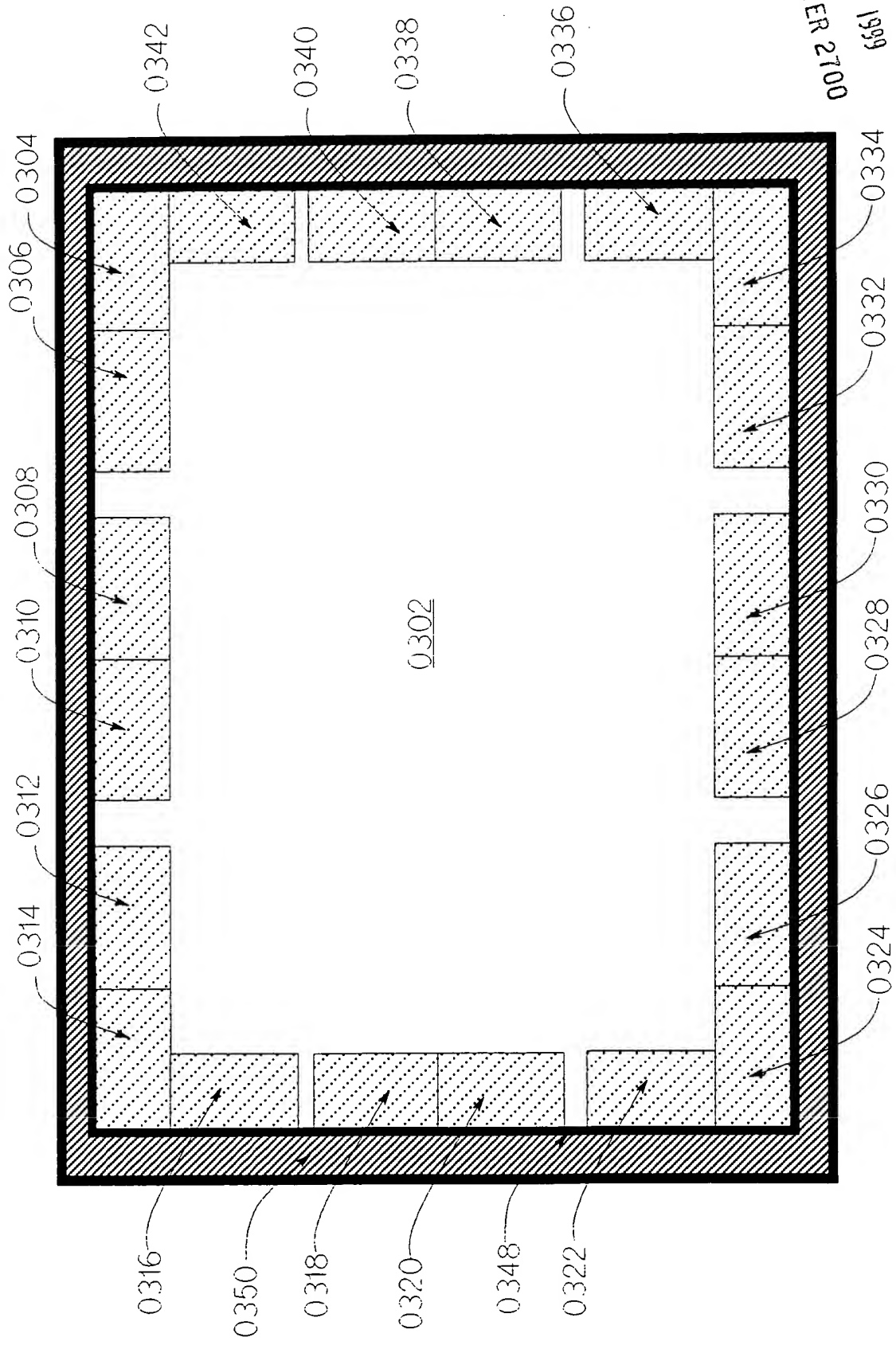
FIG. 17



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FIG. 26



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FIG. 27

